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THE USEFUL PLANTS OF COPAN[1]

BY WILSON POPENOE

LIKE their descendants who inhabit Guatemala and Yucatan at the present day, the ancient Maya were doubtless an agricultural people who depended principally upon maize, beans, and squashes for their staple foodstuffs, cultivating in addition a number of other crops which played a less important part in their dietary.

Considering a particular portion of the Maya territory, the valley of the Copan river in western Honduras, what were some of the plants which produced foodstuffs or were otherwise useful to the ancient inhabitants? In attempting to answer this question several lines of investigation have been followed. First a catalog has been made of the useful plants found in the valley at the present time, as determined by two visits to the region in the spring of 1917. Next by studying the known geographic distribution of the various species in this list it is possible to indicate which were probably in the region in pre-Colombian times and which are of recent introduction. And finally, taking the species known to be indigenous, the utilization of certain of them by the ancient Maya is borne out by archaeological observations; while others lacking direct confirmatory evidence of this character must be considered to have played a part in the economy of the Maya solely because they have very evident uses, and because they are known to have been in the region since a remote period.

[1] I am greatly indebted to Mr. W. E. Safford of the Bureau of Plant Industry for carefully criticizing the manuscript of this paper, and for adding numerous items of interest.

If, as believed by archaeologists, the ancient inhabitants of Copan were bound by ties of commerce with the peoples of contemporaneous cities to the northward, such as Quirigua, Menche Tinamit,[1] and Palenque, there was probably an exchange of many important articles between these different regions. The Quirigua region in the lower Motagua valley, because of its proximity to Copan, must certainly have been drawn upon for many plants which do not exist at the higher elevation of Copan. However, the plants grown in the region of Copan itself are the only ones which will be considered in this paper.

The valley of the Copan river is one of those favored spots which are scattered here and there throughout Central America. There are many others very similar in character, and wherever one of them is found, it will generally be observed that it has been the scene of intense agricultural activity for centuries. Perhaps there have been periods when the forest has been allowed to reclaim the soil, as has been the case at the ancient city of Copan in recent centuries, but the unusual natural advantages of these regions have assured their cultivation, more or less continuously, since the earliest times.

Varying elevations give these Central American valleys different climatic conditions. Those in the lowlands are hot and humid, and the rank tropical vegetation is much more difficult to control than it is at elevations of 2,000 feet or more. In Guatemala, some of the most fertile and intensively cultivated valleys lie at elevations of 3,000 to 5,000 feet. The ancient Maya, however, seem generally to have chosen lower elevations. Among the sites of their capitals, Copan is one of the highest. The elevation here, as closely as could be calculated from a series of readings taken with an aneroid barometer, is 1,900 feet. The climate, therefore, is not so hot as that of Quirigua, and the exuberant tropical vegetation of the latter place is conspicuously lacking. Agriculturally considered, however, Copan would appeal to the modern European as a much more favorable region than Quirigua.

If we accept the hypothesis of Prof. Ellsworth Huntington, to

[1] More generally known as Yaxchilan.

the effect that there has been a shifting of the climatic zones throughout the Maya territory, with the result that regions now considered almost uninhabitable were formerly much more salubrious, it is easy to understand the presence of thriving communities in such regions as the Usumacinta valley. Without some such hypothesis it is difficult to explain the facts as observed. In the case of Copan, however, there seems to be no reason why the site could not have been occupied by the ancient Maya under the same climatic conditions which obtain today.

The rainy season at Copan begins early in May and lasts until January. While there is no accurate means of judging, the amount of rainfall may be about the same, or slightly heavier, than it is in the Guatemalan highlands. At Guatemala city the range is from 30 to 60 inches, with an average of about 50 inches. At Copan it may perhaps be 50 to 70 inches, judging from the length of the rainy season and the character of the vegetation.

The hottest part of the year is toward the end of the dry season April and May—while the coolest part is from November to January. Copan is not high enough in elevation to experience any very cold weather, such as occurs in parts of the Guatemalan highlands. Its minimum temperature is probably between 40° and 50° F.

On uncleared slopes and knolls in the upper end of the valley the forest, which is doubtless a remnant of that which extended over the entire valley floor until some fifty years ago, is fairly dense. It is not of the distinctly tropical appearance which characterizes the forest at Quirigua, but has an abundance of tall, slender trees festooned with long moss (*Dendropogon usneoides* (L.) Raf.), with a dense undergrowth of shrubs. The splendid *cohune* or *manaca* palm (*Attalea cohune* Mart.), so impressive in the forest above Quirigua, is nowhere seen. Climbing palms are also absent, while the large leaved *aroids* and the *lianas* which are so abundant in lowland forests are comparatively rare.

The soil on the valley floor is a heavy, black, sticky clay loam of good depth. On the slopes and hillsides around the valley it is a dull brown or tawny clay, often gravelly in layers, and covered with a surface layer of black clay where it has not been exposed to

erosion. The black soil of the valley floor is excellent, from an agricultural point of view; it is sufficiently heavy so that its fertility is not easily exhausted, yet it is not too stiff to permit of tillage. The principal crops grown upon it at the present time are tobacco, maize, and sugar cane, the two former being grown alternately upon the same ground. Maize is planted at the beginning of the rainy season, about the first of May, and is harvested before the first of October. Tobacco is then planted in the same soil during the month of October, and comes to maturity after the end of the rainy season, in February and March. Tobacco is the principal export crop of Copan, while maize is extensively grown for local consumption. Sugar cane is cultivated in the lower part of the valley and is made into *panela* or crude sugar. In the manufacture of this product only the most primitive methods are employed.

Coming now to a consideration of the economic plants found in the valley of Copan at the present day, we may divide them, for convenience, into eight classes, namely: cereals and vegetables, fruits, beverage plants, plants used for seasoning and flavoring, fiber plants, plants used for coloring and dyeing, fence and hedge plants, and miscellaneous useful plants. In each division an attempt has been made to consider first the most important indigenous species, with a note as to their common names and uses; toward the end of each section will be found the introduced species in italics with a note as to their origin. These latter cannot have played a part in the life of the ancient Maya, but it seems worth while to include them, in order to complete the list of useful plants found in the valley at the present time.

Cereals and Vegetables

Zea mays L. Known in Spanish as *maiz*, in English, maize or Indian corn. Several different varieties are grown in the valley of Copan at the present day. Some of these differ in the time of maturing, others in the color of the grain. Maize was undoubtedly the great staple food crop of the ancient Maya, as it is today among their descendants. It is prepared for eating in very few ways, nearly the entire crop being consumed in the form of *tortillas*, thin round

cakes made by treating the maize with lye, grinding it coarsely on the *piedra de moler* or grinding stone, adding enough water to make a paste, and cooking the thin cakes for a few moments on a clay griddle.

Phaseolus spp. The *frijol*, or bean. Several species are represented among the beans commonly cultivated in Central America. The black bean, a form of *P. vulgaris* L., is by far the commonest. It ranks next to maize as a staple foodstuff among the present inhabitants, and its cultivation dates from remote antiquity.

Pepo maximus (L.) and *Pepo vulgaris* Moench. The *ayote*, or pumpkin and squash. Numerous varieties are grown, varying in size and shape as well as other characters. Often the vines are cultivated in maize fields; they are also grown in dooryards and about the huts of the natives. The flowers and the green fruits, while still very small, are sometimes cooked and eaten with meat. The mature fruit is an important article of food. The seeds (*ayoachtli*) are dried in the sun, after which the kernel is removed and eaten. The squash is known to have been an important food plant in the earliest times, and doubtless played an important part in the daily life of the ancient Maya.

Chayota edulis Jacq. (*Sechium edule* Swartz). The *güisquil*, usually called chayote in English. A cucurbit which is exceedingly common in Guatemala, and much esteemed by the Indians. Its pear-shaped or roundish fruits, three to six inches long, may be either smooth or prickly externally, white or green in color. When boiled they somewhat resemble summer squash. Many varieties are grown in this region. Doubtless their cultivation dates from a very remote period.

Ipomoea batatas (L.) Poir. The *camote*, or sweet potato. This is not a common crop in the vicinity of Copan, but is fairly well known to the better class of inhabitants. Purple and yellow varieties are grown, both rather inferior in character, as the tuberous roots are slender and small. Cultivated by the Aztec in Mexico, this root crop was probably used by the Maya as well.

Yucca elephantipes Regel. The *isote*, a plant often used for hedges and fence rows, but producing flowers which are eaten, most

commonly in the bud stage but also when fully developed. They have a bitterish taste when cooked, and are eaten with meat stews or are mixed with other vegetables to form a salad. Probably its cultivation in this region dates from very ancient times. Its leaves yield a fine fiber, but this does not seem to be used in Copan at the present time.

Lycopersicum esculentum Mill. The *tomate*, or tomato (Nahuatl, xitomatl). This common vegetable was cultivated by the Aztec. It should also have been known to the ancient Maya of Copan. At the present time it is a very common plant, but the varieties grown are inferior, the fruits rarely attaining to the size of walnuts. They are used principally to flavor stews.

Physalis pubescens L. The *miltomate*, usually known in English as ground-cherry or husk-cherry. Not common in Copan at the present time, but exceedingly abundant in the nearby Guatemalan highlands. It was cultivated by the Aztec, and may well have been used by the ancient Maya. It is used by the Guatemalan Indians as an addition to meat stews of all sorts.

Manihot utilissima Pohl. The *yuca*, or cassava plant. This was a staple food crop of the greater Antilles and of the Amazon basin in pre-Columbian times, as it is today. To the Mexicans it was known as the tree-camote (*quauhcamotl*) in these regions. It is occasionally seen at Copan and in other sections of Central America, but it is to be doubted if it was much cultivated here during the days of the Maya occupancy.

Dioscorea alata L. The *ñame* or yam. Scarcely known at Copan today, but said to be grown in a few gardens. It is, in all probability, a native of tropical Africa and was not cultivated by the ancient Maya. It was brought with negro slaves from Africa to the New World. The sweet potato seems to be preferred to it in this part of Central America at the present time.

Fruits

Spondias purpurea L. The *jocote* or Spanish-plum (Nahuatl, xocotl, now usually known in Mexico as ciruela). One of the commonest indigenous fruit trees throughout this region. It is propa-

gated very easily, either by seed or by planting large cuttings, the latter sometimes being put in as fence posts. Several varieties or races are grown at Copan, varying in size, form and color of the fruit, as well as in flavor. Undoubtedly this was an important fruit among the ancients, as it is among their descendants of the present day. *Jocote* trees are common among the ruins of Copan.

Spondias lutea L. The *jobo*, or hog plum. A species much inferior to the last in quality of fruit. It is a common indigenous tree of this region. The fruits are small, and have a rather acrid taste, but are eaten by the natives.

Psidium guajava L. The *guayaba*, or guava. One of the commonest fruits of present day Copan, and doubtless well known to the ancients. It grows abundantly, both wild and cultivated. The fruits vary in size and shape, but most commonly are round, about an inch and a half in diameter. They are principally eaten out of hand.

Psidium molle Bertol. Also called *guayaba* at Copan, but known in some other regions as *guayaba ácida*, or sour guava. A very common indigenous plant, found on all the hills surrounding the valley. The fruit, which is greatly inferior to that of *P. guajava* in quality, is round, an inch in diameter, very acid when ripe. The plant is smaller than *P. guajava*, with the young leaves softly pubescent. The fruit does not seem to be much used at present.

Byrsonima crassifolia HBK. The *nance*, called *nanche* in Mexico (Nahuatl, nantzin). A very common indigenous tree throughout this part of Central America, frequently growing on rocky slopes. The small yellow fruits, the size of a large cherry, contain a large seed and are of rather harsh taste. They are nevertheless known to the ancient Maya.

Persea americana Mill. (*P. gratissima* Gaertn.). The *aguacate* (Nahuatl, ahuacatl), known in English as avocado. In all probability this fruit was cultivated in ancient times. It is not common today at Copan, but there are a few trees along the river. They are all of the West Indian race, which is the most successful at elevations below 2,500 feet in this part of tropical America. It is unfortunate that more is not known concerning the part which the

avocado played among the Maya, now that this fruit is attracting so much attention in the United States.

Persea sp. The *shucte* or *chucte*, known as *coyó* in northern Guatemala. A species closely allied to the *aguacate*, but having a ferruginous tomentum on the young branchlets and lower surfaces of the leaves, while the flowers are marked with red at the base of the perianth segments. The fruit resembles that of the aguacate, but is different in flavor. As far as can be judged, the tree is indigenous in this region.

Calocarpum mammosum (L.) Pierre. The *zapote* (Nahuatl, tzapotl). Indigenous in this part of Central America, and likely an important fruit in ancient times. There are only a few trees in the valley of Copan today. Northward in Guatemala it is very abundant.

Achras zapota L. (*Sapota zapotilla* Coville). The *níspero* or *chico*, called sapodilla in English. A delicious fruit, common in the lowland forests of eastern Guatemala, and occasionally cultivated in the valley of Copan at the present day. Chicle, from which chewing gum is manufactured, is obtained from this tree. This must have been an important fruit among the Maya.

Muntingia calabura L. The *capulín*, a small tree which grows abundantly along the banks of the Copan river, especially in the vicinity of the ruins. Its fruits are red, the size of a cherry, sweet, with numerous minute seeds. Not a fruit of great merit.

Licania platypus (Hemsl.) Fritsch. The *sunza* or *sunzapote*. A large tree which bears rough, brown, irregularly shaped or oval fruits the size of a small melon, with a large fibrous seed and scanty pulp resembling the true zapote in flavor. A few trees are growing near the present town of Copan. Indigenous in this general region.

Hymenaea courbaril L. The *guapinol* (Nahuatl, quauhpinolli, "pinoli tree"). A leguminous tree producing short plump pods containing a sweetish pulp (pinoli) eaten by the Indians. Widely distributed in Central America, and known, doubtless, to the ancients.

Annona reticulata L. The *anona*, or custard-apple. This tree is wild and abundant in the valley, principally along ravines and

water courses. Its heart-shaped fruits are not as good as those of the *anona blanca*, but are esteemed by the natives. Probably known here in ancient times.

Annona purpurea Moc. & Sessé. The *suncuya*. A tree with much larger and coarser leaves than the preceding, and enormous round fruits, covered with sharp conical protuberances. The flesh is orange colored, and resembles in flavor the North American papaw (*Asimina triloba* Dunal). The natives do not consider it wholesome; it is commonly believed, in fact, to induce fever. It is unquestionably indigenous in this region, being found abundantly along water courses.

Annona diversifolia Safford. The *anona blanca*. Comparatively rare, but one of the finest *anonas* grown here. The fruits are similar to those of *A. reticulata* in form, but larger, and glaucous externally. The flavor is sweet and pleasant. This is a really good fruit which must have been esteemed by the ancient Maya.

Annona muricata L. The *guanábana*, or soursop. Not common, but a few trees are said to be growing in some of the *fincas* near Copan. Probably its introduction into this valley is comparatively recent.

Casimiroa edulis LaLlave & Lex. The *matasano*, or white sapote. Not so abundant here as it is in the highlands of Guatemala, but occasionally seen. One of the common indigenous fruits of Central America. It must certainly have been known to the ancients.

Vitis caribaea DC. The *uva silvestre*, or wild grape. An indigenous species which climbs over trees in the ravines around the edge of the valley. Its fruits are small and sour, but are used by the natives.

Carica papaya L. The *papaya*. An important fruit commonly cultivated in the gardens of Copan at the present day. It must have been known to the ancient Maya, since it is indigenous in this part of tropical America.

Cereus sp. Erroneously called *tuna*, which name properly belongs to species of *Opuntia;* its correct name in Spanish is *pitaya* or *pitahaya*. This cactus, with 3-angled stems and large rose-colored fruits, is grown in one or two gardens.

Ananas sativus Schult. The *piña*, or pineapple. Grown in several gardens near Copan, and undoubtedly one of the fruits cultivated by the ancient Maya.

Inga radians Pittier. The *paterna*. A leguminous tree producing a large, flattened pod containing a sweet pulp. Not common in Copan at present, but abundant in Guatemala. It may likely have been one of the food plants of the ancients.

Anacardium occidentale L. The *jocote-marañon* or cashew. Rarely seen, but there are a few trees in the valley. While indigenous in northern South America, it probably was not known this far north before the Conquest.

Musa sapientum L. and *M. paradisiaca* L. The *guineo* or banana, and the *plátano* or plantain. Both these species are abundant at Copan, several varieties of the banana being grown. They must have been introduced since the Conquest, and hence were not known to the Maya.

Mangifera indica L. The *mango*, a well known East Indian fruit introduced since the Conquest, and now very common in tropical America. It is quite successful at Copan, and has become one of the commonest fruits. The varieties seen here are very inferior, however.

Citrus aurantium L., the *naranja dulce* or sweet orange; *C. limetta* Risso, the *lima* or sweet lime; *C. limonia* Osbeck, the *limón* or sour lime; *C. decumana* L., the *cidra* or citron. All these citrus fruits, of Asiatic origin, have been introduced since the Conquest and are now grown in the gardens of Copan. The sweet orange and sour lime are particularly common. The citron is rare.

Cocos nucifera L. The *coco* or coconut. Whether it be considered that this plant is of Asiatic or American origin, it seems practically certain that it was not known in Central America before the advent of the Spaniards. It is now fairly abundant in this region.

Punica granatum L. The *granada*, or pomegranate. A few bushes are growing in Copan dooryards. The species is of recent introduction, its home being in the Orient.

Tamarindus indica L. The *tamarindo* or tamarind. This old-world tree is of very recent introduction in Copan, there being only a few young specimens four or five feet high.

Beverage Plants

Theobroma cacao L. and T. *Ciocarpum* Bernoulli. *Cacao* or chocolate. Undoubtedly the Maya prepared one of their important beverages from cacao. The seeds were also used as currency by the Maya in Yucatan at the time of the Conquest, and even much later.

Theobroma bicolor Humb. & Bonpl. The *patashte*. This species is very similar to the *cacao*, but the seeds are larger and not so rich in flavor. It is indigenous in this part of Central America. Probably it served in ancient times, as it does today, to prepare an inferior beverage, or to mix with *cacao*.

Coffea arabica L. *Café* or coffee. Of oriental origin, and not introduced into America until some time after the Conquest. It is now cultivated to a considerable extent in the vicinity of Copan.

Plants Used for Seasoning and Flavoring

Capsicum frutescens L. *Chiltepe*. This is the small, perennial species of chile pepper, whose fruits, though no larger than peas, are exceedingly piquant. It is one of the common plants growing on the ruins at the present time. Doubtless it served in ancient times, as it does today, to make chile sauce.

Capsicum baccatum L. *Chile* or chile pepper. The annual chiles are much larger than *C. frutescens* and not so hot. They are cultivated in the gardens of the natives. Several varieties are common.

Vanilla planifolia Andr. *Vainilla* or vanilla (Nahuatl, tlilxochitl). The climbing orchid which produces the vanilla "bean" is said to occur in the forest not far from Copan.

Fiber Plants

Gossypium peruvianum Cav. *Algodón* or cotton. This was one of the principal textiles of the ancient Maya, furnishing the material for most of their clothing. While not grown commercially near Copan at the present time, the few plants seen in dooryards about the town indicate that it thrives here, and it may have been cultivated extensively in ancient times. Possibly other species than *G. peruvianum* have grown here.

Sabal sp. Commonly termed *palma real* (royal palm). An indigenous palm with fan-shaped leaves, somewhat resembling the cabbage palm of Florida in general appearance. It is common in the valley of the Copan river a short distance below the present town, but is not now seen in the immediate vicinity of the ruins. It furnishes most of the fiber used by the present inhabitants of the valley to manufacture hats, mats, and other useful articles. Doubtless it was put to similar uses in ancient times.

Carludovica palmata R. & S. This plant, which yields a finer fiber than the *palma real*, is not found in the immediate vicinity of Copan, but is said to grow at lower elevations not far distant. It furnishes the fiber from which the so-called Panama hats are made. It is used by the natives of this part of Central America, though the manufacture of hats is not an important industry.

Acrocomia vinifera Oerst. The coyol palm. The fiber obtained from this palm is not much used at the present day. The fruit is edible and occasionally seen in the markets. The plant is one of the characteristic indigenous species of the region.

Plants Used for Coloring and Dyeing

Bixa orellana L. *Achiote*, known in English as arnotto. A small tree occasionally seen in this region. The outer covering of the seed is fleshy and yields a brick-red coloring matter much used to color foodstuffs and beverages, and occasionally for other purposes.

Jacobinia tinctoria (Oerst.) Hemsl. *Saca-tinte* (Nahuatl, mohuitli). A small shrub yielding a blue dye similar to indigo. Fairly common in gardens.

Due to the widespread use of aniline dyes throughout Central America at the present day, it is difficult to determine many of the plants which yielded dyes in ancient times. Doubtless there were a number of species utilized by the ancient Maya whose value is not known to most Central Americans of the present day.

Fence and Hedge Plants

Bromelia pinguin L. The *piñuela* or *piñuela de motate*. A plant allied to the pineapple and resembling it in growth. It is

larger and coarser, however, with the leaves more coarsely serrate. It is commonly planted to form impenetrable hedges, and the small acid fruits which it produces are occasionally used to make refreshing drinks.

Erythrina corallodendron L. *Flor de pito*, or coral tree. A small tree, easily propagated from cuttings, which is planted for hedges and produces edible flower buds as well. These buds, which are picked when quite young, are boiled and eaten as a vegetable. The seeds of this plant are used by the *brujos*, or witch doctors, of Guatemala in divining. Probably cultivated in ancient times.

Gliricidia maculata HBK. *Madre de cacao*. A small tree producing handsome pink flowers in the greatest profusion. It grows readily from cuttings, and for this reason, probably, is commonly planted in fences. It is grown for shade in cacao plantations, a use which seems to have come down from the earliest times.

Jatropha curcas L. *Piñon* or physic nut. A plant of tropical American origin, not as common at Copan as the preceding. Its oily seeds are a drastic purgative, little used. Usually found in hedges or fence rows.

Miscellaneous Useful Plants

Nicotiana tabacum L. *Tabaco* in Spanish (Nahuatl, yetl or picietl), tobacco in English. One of the principal crops of present-day Copan. The use of this plant as a narcotic was common among the ancient inhabitants of tropical America.

Crescentia cujete L. The *jicara* or calabash (Nahuatl, quauhtecomatl, "tree gourd"). This is one of the most useful trees of the region, producing receptacles which are found in every household. Three varieties are known at Copan, a small, round-fruited one called *morro;* a larger, elongated one called *jicara*, and a large oblate one known as *guacal*. The tree is indigenous in this region and very abundant. Undoubtedly it was as useful to the ancient Maya as it is to the Central Americans of today.

Curcurbita lagenaria L. The *tecomate*, or gourd (Nahuatl, tecomatl). Like the *jicara*, this plant produces many useful receptacles and is seen in nearly every garden. The gourd is one of the very

few useful plants which are known to have been distributed throughout both hemispheres before the discovery of America.

Ricinus communis L. The *higuerillo* or castor bean. Very abundant along the river, especially in the vicinity of the ruins. The oil obtained from its seeds is useful in several ways.

Pinus tenuifolia Benth. The *ocote* pine (Nahuatl, ocotl, "pitch"). One of the characteristic trees of the region, growing in great abundance on all the hillsides. Its wood, which is saturated with resin, is termed *ocote* and is used to kindle fires and for illuminating. It is the only material used for illumination by the poorer natives. It must have been a very useful species to the ancient Maya.

Protium Copal Engl. Copal. A small tree common on the hillsides. A gum is obtained from incisions in the trunk which is burned as incense, and plays an important part in the religious ceremonies of the Indians. Most probably it was used in the same way by the ancient Maya. There are several other plants in Central America which furnish resins used in the same manner.

Castilla sp. *Hule* or rubber tree (Nahuatl, olli, or uli). Wild in the vicinity of Copan, but not cultivated commercially. Probably its latex was utilized by the ancients.

Saccharum officinarum L. *Caña de azucar*, or sugar cane. A plant of Asiatic origin, introduced since the Conquest and now an important crop in Copan.

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MOUNTAIN HAUNTS OF THE COASTAL ALGONQUIAN[1]

By MAX SCHRABISCH

IT was in 1899 that the writer began the study of prehistoric rock shelters, that is, natural rock formations anciently resorted to by the Redman because of the protection they afforded from the elements. A thorough and systematic search continued for the past twenty years led to the discovery of no fewer than one hundred and twenty-nine of these interesting sites, scattered over an area of approximately 5,000 square miles. Owing to the Indian's former presence under these rocks each of them yielded remains of his handiwork or other refuse attributable to him, often in great abundance and of such a nature as to throw much light upon his mode of life, while sojourning under their hospitable roof.

Strange to say, all these primitive abiding places had evidently remained undisturbed since the Redman's final departure, excepting a few cases, where some modern junk was found on the surface beneath the sheltering roof, left behind, no doubt, by some modern hunters or timbermen. As a consequence, the culture débris accumulated under the rocks was always intact or in its original condition and all the archaeological objects embedded therein were lying in situ, viz., in the very place where he had dropped them.

The fact that this class of sites had wholly escaped the attention of curio hunters who, it would seem, never suspected their true significance, could not but be gratifying to the investigator whose aim is not merely the collecting of relics but rather the gleaning of such information as may be legitimately derived both from the assemblage of artifacts and their relative position in the subsoil. If correctly interpreted, the data thus observed may, indeed, serve to elucidate many a problem involved in the study of the American Indian.

[1] Read by title at the Baltimore meeting of the Anthropological Association, Dec., 1918.

Distribution of Sites

The area explored by the writer comprises most of the territory extending southward from the Catskills in New York state to a line across New Jersey, from Lambertville on Delaware river to Perth Amboy on Raritan bay, and is bounded on the west by the Delaware and on the east by Hudson river, thus including a large portion of southeastern New York and all of northern Jersey.

In the State of New York fifty-one rock stations have so far been noted, namely, ten in Rockland county, twelve in Orange county, and twenty-nine in Ulster county. Discarding modern geographical nomenclature and considering only the physiographic features amid which they occur, their distribution is as follows: Four in the Catskills, twenty-five in the Shawangunk range, and twenty-two in the Ramapo mountains. In other words, all the prehistoric rock sites in New York state known to the writer are situated within the mountains or at their outskirts.

In New Jersey these sites are distributed in a somewhat similar manner for of a total of seventy-eight discovered about two thirds lie in mountainous districts. In point of fact, there is scarcely a range of hills in northern New Jersey but is remarkable for the occurrence within it of one or several aboriginal rock shelters. This is particularly true of the New Jersey highlands and to a lesser degree of the Kittatinnies, the Watchung, the Jenny Jump, and the Musconetcong mountains. However, as already indicated, a considerable number of these stations lie at some distance from the hills, but wherever this is the case the contour of the land or the natural features surrounding them are invariably quite rough, being characterized by ledges and rocky ridges.

If in a river valley, sites of this description were apparently in great demand, and this for obvious reasons. For as they lay along the more important prehistoric routes of travel, which commonly followed the river courses, they could not only be easily approached, but the proximity of a stream well stocked with fish was bound to make them desirable for habitation, since fish was largely depended upon for food, it forming an important part of the Indian's diet.

Nor does it appear that the aborigine was at all fastidious, when about to make use of a covert thus situated, as he would not infrequently avail himself of one that was quite small and otherwise uncomfortable, provided, of course, that he did not have much choice.

It is clear, therefore, that easy access or favorable situation was a factor of some weight with the savage in influencing his selection of a natural shelter, however mean. On the other hand, there is many a rock-house of good configuration that had been spurned seemingly for no other reason than its remoteness from the beaten path or else, perhaps, on account of the propinquity of other shelters that, for some cause or other, were more to his liking, in which case he generally evinced, it seems, a considerable degree of native shrewdness choosing, without doubt, one which was in every sense best suited for his purpose.

A careful survey of the river valleys of northern New Jersey resulted in the identification of some eighteen rock stations, most of them of small dimensions and rather unattractive from a structural viewpoint, their redeeming feature having been favorable position. Only six of these, however, are on or close to the bank of the main stream, the others lying on some tributary at some distance from the former.

On Delaware river four sites were found, the most important of which is at Delaware Water Gap, above Dunnfield creek, at the foot of Blockade mountain. Along Paulinskill valley there are twelve; one is on Pequest river, and another on the bank of the Hudson, at the base of the Palisades about opposite Yonkers.

Classifying all the northern New Jersey rock stations according to counties, Warren county ranks first with twenty-nine; in Sussex county twenty-five were located; in Morris eight; in Passaic eight; in Bergen four; in Essex two and in Hunterdon two. This shows that the majority of these sites are in northwestern New Jersey, where the hills are highest and the topography more rugged than elsewhere in the State.

Principal Types

As may be readily imagined, rock shelters exhibit an endless variety of structure and this to such an extent that, strictly speaking, each is in a class by itself. They are subjected to the operation of the law of evolution which holds true for the crust of the globe just as it does for the myriad tribes of plants and animals that clothe and people it.

The great geologic forces are incessantly at work shaping and reshaping, tearing down and building up the earth's crust. Nothing, not even the solid framework of the mountains, can forever withstand the assaults and destructive processes of subaërial denudation consisting in the mechanical action of heat and frost, much less the chemical effects of water, holding carbonic acid in solution. Erosive and corrosive agencies are constantly busy disintegrating the face of the earth, wearing down the lofty peaks, nay, reducing, in the course of ages, whole mountain ranges to their very foundation, that is, planing them down to a flat expanse.

Amid this amazing diversity of structure assumed by rock shelters under the operation of epigene or superficial agents of change, *i. e.*, the atmosphere, terrestrial water, and ice, four general types may, nevertheless, be distinguished. Most prevalent is that of the sheltering rock or overhanging ledge, a structure due mostly to the under-cutting of streams, by which process the lower portion of the cliff is gradually worn away, leaving a roof-shaped rock-mass on top. The shelter, thus formed, could be utilized as a place of abode as it yielded more or less protection from wind and rain. A close study of the area under review has demonstrated that most of the prehistoric rock stations located therein are of this kind.

Nor was it only on this continent that coverts like this, furnished by nature and other types presently to be dealt with, were used. In all parts of the world, but notably in central Europe, late researches have made it clear that our ancestors, the men of the Old Stone age, were markedly troglodytic in their habits, inasmuch as they were wont to avail themselves of natural shelters, wherever found. Among famous European rock shelters, probably dating back to the Third Interglacial period about 100,000 years ago, we may mention

those of the Kesslerloch and Schweitzersbild in south Germany and Switzerland, respectively, the excavation of which within recent years has yielded a profusion of articles of human manufacture, partly belonging to the Moustérien stage of culture.

Cavities serviceable for habitation have been found at the base of or under huge erratics, particularly when they happened to be top-heavy. Such hollows, if of ample size, often contain remains of the Redman's industry bespeaking his quondam presence thereabouts. Conspicuous among this class of rock-stations are the sites of Bear Rock, Morris county, N. J., and of Stony Point, Rockland county, N. Y.

Shelters of archaeological moment occur sporadically at the foot of rock masses that become detached from a parent cliff near by. An example of this type is furnished by a station, about a mile northwest of Lake Minnewaska, on Shawangunk mountain, Ulster county, N. Y.

Another type of natural covert, not infrequently met with, partakes somewhat of the nature of a cave. It owes its origin to detritus or an accumulation of rocks piled up one above another in such a manner as to form a cavity underneath. It is usually found near the base of a high crag or escarpment, from which the detritus was derived by the breaking up of the latter under the influence of atmospheric agencies, that are ceaselessly at work disrupting and disintegrating the faces of cliffs and exposed rock masses. Most commonly, rocks are split by water freezing in the interstitial pores and forcing the grains and particles asunder. In consequence, rockfalls occur from the face of the cliffs which pile up along their base and which may, if the detached slices are large, eventually give rise to a cavern. This class of shelters is typically represented by the stations of Federal Hill, near Pompton junction, Passaic county, N. J.; Mount Buchanan, near Lake Mombasha, Orange county, N. Y.; Fox Hollow and Little Pond, on Shawangunk mountain, near Saint Josen, Ulster county, N. Y.

One more type, *viz.*, that of the cave proper, remains yet to be considered. Although a few caves were located in southeastern New York, their exploration was usually attended with negative

results, but one of these testifying to ancient Indian occupation, viz., Murderer's cave, near Johnsonburg, Rockland county. In the limestone region of Sussex and Warren counties, N. J., however, no fewer than four of these interesting sites came to the notice of the investigator, each of them of prehistoric significance.

It is well known that in lands composed chiefly of limestone, corrosion proceeds more rapidly than in rocks of other kinds. This is due to the chemical action of water. Being charged with carbonic acid derived from the atmosphere and decaying vegetable and animal matter, with which soil is more or less impregnated, it works through interstitial fissures and pores, dissolves the limestone and removes it as carbonate of lime, thus giving rise to underground channels and caverns.

Paramount in point of remains among the four limestone stations was Owen's cave, on Wallkill river, Sussex county; the others were Berry's Cove cave, south of Sussex, Sussex county; the Devil's Kitchen, near Blairstown, and the Wolf's den, near Southtown, the latter two in Warren county. A fifth one was discovered at the foot of Garret mountain, underneath a basaltic block of colossal size, within the city limits of Paterson, N. J.

While all these are small, the writer was told of at least one limestone cavern of large dimensions, namely, Hartmann's cave, some six miles west of Delaware river, near Stroudsburg, Pa. Visiting it a few years since, he learned that it had been excavated with most gratifying results some thirty years ago by Professor Holmes, of Washington, D. C., who secured more than a thousand specimens of primitive workmanship and of many different types. Hence there can be no doubt that this station was one of the headquarters of the Lenape, once ranging over all this territory.

Influence of Lithological Features in Determining Rock-formations

The rock sites of the region in question are composed of many different minerals, and it does not require much observation to be impressed with the conviction that there exists a correlation between the relative frequency of these sites and the materials enter-

ing into their composition. In short, the occurrence of this peculiar formation is largely dependent upon the character and mineral structure of rocks.

Enough has already been said to make us presume that limestone would be the rock most favorable to the formation of every kind of natural covert, suitable for habitation. And so it is. Nowhere in all this broad extent of country were rock shelters more plentiful than among the derivative limestones of Sussex and Warren counties of northwestern New Jersey. Here, more than one hundred such structures were noted, fifty-four of which bore evidence of aboriginal occupation.

In the second place come the metamorphic rocks, *i. e.*, the gneisses and granites of the Ramapo range and adjoining hills. Among fifty-odd shelters observed there, no fewer than thirty-two were found to have been occupied.

As regards the upper Silurian limestones (Shawangunk grit) of Shawangunk mountain, eligible sites were met with on almost every square mile of land investigated. In some of the gorges trenching this range they occurred in rows along the base of the precipices and cliffs that overlook the streams tributary to Rondout creek. Within a tract, forty square miles in extent or thereabouts, stretching west of Lakes Mohonk and Minnewaska towards Rondout creek, some fifty good rock shelters were located, twenty-five of which gave evidence of ancient occupancy.

Considering that less than one quarter of the territory of this range has been surveyed and assuming the ratio of twenty-five rock abodes to each forty square miles to prevail throughout its remaining sections, we may estimate their total number within this district, other things being equal, at not less than one hundred, a number which would greatly exceed the proportion per square mile observed in northern New Jersey.

Among the basaltic traps and other rocks of volcanic origin within the county of Passaic and adjacent districts there were about a dozen sites, nine of which are of archaeological significance.

Four rock stations were noted in the Devonian conglomerates or old red sandstones of the Catskill mountains within an area of

some fifteen square miles, near Woodstock, Ulster county, N. Y. There can be little doubt that additional sites dot all parts of this range.

A thorough search along the ravines and outcrops of sandstone of northern New Jersey and Rockland county, N. Y., revealed the existence of but three stations containing the telltale marks of Indian activities. Two of these are in Medina sandstone, north of Dunnfield, at the Delaware Water gap, the other is in a gully, near Tallmans, Rockland county, N. Y.

Lastly, there were two sites in slate ridges in Warren county, N. J. Shelters consisting of shale or argillaceous rocks were invariably devoid of traces of a prehistoric character.

Conditions Governing Rock Stations

The number of Indians once roaming over this region appears to have been egregiously small when contrasted with that of the whites now inhabiting it. Each of their subtribes or divisions had their well-defined precincts jealously guarded against the encroachments of neighbors, within the confines of which they had to eke out a precarious existence mostly by hunting and fishing. It may readily be assumed, therefore, that each individual Indian possessed a most intimate knowledge of his particular section, of its hills and dales, its streams and lakes, and all the prominent features of the landscape.

Their main settlements were in the river valleys or in the more open country, where they could plant maize, beans and a few other vegetables to supplement their meat diet. At certain seasons, but most generally in autumn, neighboring tribes would join in hunting trips to the mountains, which were a kind of game preserve, held in common by a group of tribes, and where they would stalk the deer and secure other quarry, valued for food and peltry. With nothing escaping their keen senses, they could not fail to acquire, moreover, a thorough familiarity with those rugged regions that at their time, were all but impenetrable, a pathless wilderness, the home of panther and bear. Thus, they came to know the runways of deer, the haunts of wild beasts, also where to find water and where to camp after the chase.

In such solitudes, far away from their villages in the valleys, it was but natural that they should avail themselves of some of the sheltering arches of rock that are of such common occurrence in many of our mountain chains. Thus it was that they would resort to rock shelters, the whereabouts of which they well knew. In making their choice, they did not proceed indiscriminately, however, but selected those that complied best with their requirements.

In the first place, a water supply had to be in the immediate vicinity. Water appears, in truth, to have been a factor of prime importance in the choice of a rock abode, but it did evidently not matter much whether such supply was furnished by a spring, a brook, a lake, or even a swamp. This failing, the best shelter would be passed by as unfit for occupation, save, perhaps, some roving Indian who might squat down in it to rest an hour or two. The observation just made has been verified in every instance, for wherever good shelters were noticed, which subsequent examination proved to be destitute of any and all traces of ancient occupation, the main reason for such avoidance was always, it seems, the absence of water.

From the evidence extant we may further infer that, apart from water, roof and floor were the only other factors determining the desirability of a site. If the former did not jut out far enough, say, less than four feet, or if it was so low as to compel crouching, the shelter was likely to be avoided. As a rule, the most favored sites were those having the most extensive roof projection. In some cases this amounted to as much as twenty-five feet, while in archaeologically inferior shelters it dwindled down to about four feet, as stated above.

Again, those sites were given preference that had a dirt floor, quite level and not mixed with too many stones. A plain rock floor or one obstructed by protuberant boulders, buried deeply in the subsoil would, it appears, constitute a serious drawback to prospective occupation. Although the remarks just made have reference to overhanging rocks or rock shelters proper, they apply equally to the other types of coverts previously described.

A factor of minor importance was the exposure or situation of

the site in regard to the points of the compass. On the whole predilection was shown for those shelters which had a more or less southerly exposure and which, therefore, received a more generous amount of sunlight and warmth. Occasionally, however, this rule was found departed from, doubtless, on account of certain other features compensating for this disadvantage.

If we try to picture to ourselves the condition of this region at the time "when wild through woods the noble savage ran," a region covered with jungles or primeval forests, choked with windfalls and an all but impenetrable growth of luxuriant underbrush, reaching in one vast expanse from the Atlantic to the great plains, with mountain fastnesses, trackless and impassable, save for a few narrow trails used by man and beast alike, we may well wonder how the Redskin could move about as freely as he did, how he managed to penetrate to certain sections that, even now, are well nigh inaccessible. Yet to him nothing was inaccessible; he visited every point, knew every landmark, every rock and left his mark wheresoever he went. Consequently, his traces are dug up under rock shelters that are even at the present time quite difficult of approach, situated, as they are, in the heart of the mountains, many miles from the river valleys and the nearest human habitations, both his own, that are no more, and those of the Whites. As mere remoteness did not detract from any site, if otherwise suitable, we need not wonder that rockhouses of the first magnitude with respect to remains have been found in out-of-the-way places.

The Most Important Rock Stations

The bulk of the one hundred and twenty-nine sites noted lie in the mountains, the others among the foothills or in the river valleys. No less than fourteen of these stations were of considerable archaeological significance by reason of the multiplicity and variety of the remains left behind.

The New York sites were scattered over three mountain ranges. In the Catskills, one at the southern slope of Overlook mountain, north of Woodstock; in the Shawangunk mountains, one upon the banks of Peters kill, near Saint Josen, and in the Ramapo range, the

Golf Hill station, three miles north of Southfields; Man of War rock, at Tuxedo; Horsestable rock, two miles east of Tuxedo, and the Stony Point rockhouse, four miles west of the Hudson river.

In the limestone district of Sussex county, northwestern New Jersey, there occurred four sites, *viz.*, Bevans rockhouse, a mile east of Delaware river; Owen's cave, on Wallkill river; the Gum Hollow shelter, southeast of Swartswood lake, and Moody's rock, on the Muckshaw swamp, two miles south of Newton.

Then there is a site at Delaware Water Gap; another one at Bear rock, four miles north of Boonton; one a mile west of Pompton Plains, the last two in Morris county, and one at Upper Preakness, a mile south of Franklin lake, Passaic county.

Culture Remains Under Rocks

In no case, as stated elsewhere, had the original conditions been tampered with. The superficial débris, that had accumulated within the shelters since Indian times, consisted chiefly of dead leaves and rock rubble, associated occasionally with some modern waste, such as pieces of rusty iron, glass and broken earthenware. Beneath it, that is, on the original surface, there often lay chips of flint and of other material, bones, potsherds, and even arrowpoints. The culture deposits enclosing the bulk of the remains at varying depths below the surface, were frequently of blackish soil due to an admixture of charcoal and ashes. The latter were suggestive of ancient fireplaces, traces of which could often be discerned in the shape of squares, rudely built of rocks, commonly along the inner wall of the shelter, which then exhibited smoke stains and the effects of the action of fire. The hearths were sometimes filled with charred bones, fire-cracked pebbles, and other refuse.

Some of the stations were remarkable for the immense quantity of bones embedded both in the subsoil under the rock and in special pits near its center or sides, where they formed veritable ossuaries. Although most of the bones were cervine, *i. e.*, belonging to deer, those of rabbit, skunk, opossum, muskrat, raccoon, bear, wild turkey, and other animals were not lacking. Doubtless, such places were the scene of much feasting indulged in after the chase.

The stations of Overlook mountain, Golf hill, Horsestable rock, and Stony Point may be adduced as typical of this class.

In shelters lying near lakes and streams large quantities of fresh water mussels called *Unio fluviatilis* have been encountered, a fact showing that the aborigine was quite fond of this fare. At the Stony Point site these were found associated with numerous oyster shells, a bivalve which could be obtained at places not many miles off. As a curiosity we may mention that a solitary oyster shell was dug up in the Indian deposit two feet below the surface at Owen's cave, fully seventy miles away from the nearest supply.

The types of implements most frequently met with in the débris are arrowpoints, scrapers or fleshers, pitted stone hammers, spearheads, and fragments of pottery. In one of the Towaco shelters, Essex county, N. J., the writer secured a gorget or pendant of slaty material, which was perforated at both ends. Singularly enough, the rarer types of artifacts, such as tomahawks, stone hatchets, celts, and pipes, were absent at all the sites under discussion, excepting the Overlook mountain station which yielded a broken celt and a fragmentary pipe made of steatite.

Potsherds, *viz.*, pieces of pottery, plain or decorated and invariably of Algonquian origin and design, occurred mostly in the upper strata of the accumulated culture deposits. The fact that the lower layers were usually devoid of ceramic ware would seem to indicate a stage of culture when the art of pottery making was yet unknown in these parts. There is, indeed, good ground for assuming that this art was of comparatively late introduction among the tribes of the Atlantic seaboard. But whether the conditions thus observed hint at several horizons of culture must at the present state of our knowledge be considered an open question.

Not a few sites contained no pottery whatever, among them the great station of Horsestable rock. This may be interpreted as meaning that they were never visited by females, for according to Indian ethics it was their duty to carry pots and other household utensils, it being considered beneath the dignity of a warrior to encumber himself with such articles. As conversely some shelters yielded nothing but pottery, we may be justified in assuming that

they were resorted to by women only, and that at certain periods in common with the usages observed by primitive peoples the world over. Sites of this class have been dsignated as squaw shelters.

Some stations appear to have been used as workshops, if we are to judge from the profusion of flakes, chips and unfinished specimens left behind. Examples of this kind are furnished by most all the important sites as well as by a few smaller ones, notably the station at Huckleberry swamp, on Shawangunk mountain, near Saint Josen, N. Y. Others, again, were little chipping sites to which the red huntsman would repair to fashion a point or two. On Shawangunk mountain, in particular, many such places have been noted.

There are several shelters that bear witness to prolonged occupation, while others seem to have been visited periodically or temporarily, but that for many centuries, either by hunters alone or by whole families, compelled by the exigencies of their existence to shift their quarters.

The Ancient Occupants

It is certain that the occupants of the rock stations occurring in this wide tract of country were of Algonquian stock, and it is equally certain that they were Lenape, for according to Heckewelder, our foremost authority, the settlements of the Lenape extended from the Mohicannituck (Hudson river) to beyond the Potomac; and from the headwaters of the great rivers Susquehanna and Delaware to the Atlantic ocean.

On the other hand, it is questionable whether all the sites within this region had been tenanted by the Munsee alone, *i.e.*, the northernmost of the three divisions of the Lenape, or whether the Unami, adjoining them southward, frequented some of them, that is, those which lie in New Jersey, south of the Ramapo mountains.

If we follow Heckewelder's lead, all the sites here treated of were anciently resorted to by the Munsee only, for he says that they extended their settlements from the Minnesink, a place named after them, where they had their council seat and fire, quite up to the Hudson on the east, and to the west or southwest far beyond

the Susquehanna; and that their northern boundaries were supposed originally to be the Hudson and the great rivers Susquehanna and Delaware, and their southern boundaries that ridge of hills known in New Jersey by the name of Musconecun, and in Pennsylvania by those of Lehigh and Cohmewag.

According to Ruttenber, however, the Munsee territory extended from the Catskill mountains to the headwaters of the Delaware and Susquehanna, and was bounded on the east by the Hudson; their council fire was lighted at Minnisink, about ten miles south of Maghackemek, N. Y.; and the Unami joined the Munsee on the south, somewhere about Stony Point.

Ruttenber gives the various subdivisions of the Munsee along the Hudson and their location: the Waoroneck about Dans-kammer; the Warranawonkong from Dans-kammer to Saugerties; the Mamekoting west of Shawangunk mountain; the Wawarsink in the district which still bears their name; the Katskills north of Saugerties.

These then were, it would seem, the names of the tribes that once made use of the rock haunts occurring in the Catskill and Shawangunk mountains.

PATERSON,
NEW JERSEY

THE SERPENT MOUND OF ADAMS COUNTY, OHIO

By CHARLES C. WILLOUGHBY

THE Serpent Mound of Adams county, Ohio, has always been a source of interest and speculation among archaeologists. With the exception of the Dighton Rock inscription in Massachusetts, perhaps no example of the handiwork of the prehistoric Indians of the north has been subject to more discussion or has given rise to more fanciful interpretations.

The site chosen for this great effigy was probably determined largely by superstitions which may have been connected with the headland upon which it was built. This headland, rising to a height of about 100 feet, gradually narrows and terminates in a cliff, bearing a certain resemblance to the head of a reptile, as shown by the accompanying photographs (plate X, *a*, *c*). The contour of the head, the muzzle, the eye, and mouth are clearly indicated. The Indians may also have seen in the promontory extending backward from the head along the shore of Bush creek, the body of the serpent deity. Natural formations, peculiarly shaped stones, concretions, and other objects resembling human or animal forms or any of their parts, were generally supposed to possess supernatural powers, and in this instance, with a little imagination, one can easily approach the Indian's point of view. Professor Holmes has called attention to this resemblance in the following words:

> Having the idea of a great serpent in the mind, one is at once struck with the remarkable contour of the bluff, and especially of the exposure of rock, which readily assumes the appearance of a colossal reptile lifting its front from the bed of the stream. The head is the point of rock, the dark lip-like edge is the muzzle, the light-colored under side is the white neck, the caves are the eyes, and the projecting masses to the right are the protruding coils of the body. The varying effects of light must greatly increase the vividness of the impressions, and nothing would be more natural than that the Sylvan prophet . . . should recognize this likeness and should at once regard the promontory as a great manitou. His people would

be led to regard it as such and the celebration of feasts upon the point would readily follow.[1]

The relation of the Serpent Mound to this promontory is clearly shown in the photograph of our model (plate X, *a*).

Squier and Davis[2] published the first plan of the Serpent Mound in 1848 (plate XI, *a*). This they claim was from an "accurate survey" made by them in 1846. It is very apparent however that the plan was prepared from a rough field sketch with little attempt at accuracy, either in dimensions or delineation. Their measurements are often much in excess of the actual dimensions, and may have been estimated by pacing. The following table of measurements by different investigators, of the length and breadth of the oval forming a part of the serpent head will serve as an example:

	Date.	Length of Oval.	Width of Oval.
Squier and Davis	1846	160 feet	80 feet
J. P. McLean	1884	113 "	50 "
F. W. Putnam	1887	120 "	60 "
C. C. Willoughby	1918	119 "	59 "

On their plan the oval is represented much too large in proportion to the rest of the effigy and is shown extended forward nearly to the edge of the cliff and surrounded by a trench. That portion of the effigy between the front end of the oval and the point of the cliff, which is 69 feet in length and forms the front part of the serpent's head, is not shown. Their cross-section through the oval, however, is of considerable interest as it indicates that the edges of the promontory upon which the oval stands may have been slightly higher than at present. This portion of the promontory was undoubtedly graded and its shape modified on either side of the oval to form the outline of the serpent's head. Squier and Davis also note that this part of the hill was "artificially cut." Although their cross-section does not show it, these writers say that the ground within the oval was slightly elevated, as it is at the present time. The height of the oval embankment they give as four feet, whereas

[1] W. H. Holmes, *Science*, vol. VIII, 1886, p. 627.

[2] Squier and Davis, Ancient Monuments of the Mississippi Valley, *Smithsonian Contributions to Knowledge*, vol. I, plate XXXV.

A

B

C

THE SERPENT MOUND OF ADAMS COUNTY, OHIO

A, Model of the Serpent Mound; *B*, View showing neck, base of head, and projection at the right, taken at the time of the restoration of the earthwork in 1887; *C*, A part of cliff resembling a colossal head, at the end of promontory in front of Serpent Mound.

McLean's measurement was 2′6″. The present height is 3′6″ from the outer side and 2′8″ from the inner side.

Recognizing as parts of the effigy only those portions shown in their plan, Squier and Davis saw in these embankments a serpent with its mouth "open wide as if in the act of swallowing or ejecting an oval figure." The head and open mouth being that portion at the rear of the oval considered by the present writer as representing only the base of the head, it is not surprising that these pioneer investigators should see the analogy between the figure thus interpreted and certain old-world symbols.

McLean in 1885 appears to have been the first to recognize the forward embankment as a part of the effigy, and in that year published a plan and description of the serpent which is much more accurate than that of Squier and Davis. This is reproduced on plate XI, *b*. Following these authors, however, in so far as the main portion of the effigy is concerned, he also saw in the earthwork a serpent with open jaws in the act of swallowing an egg. In the additional forward embankment, he traced the outline of a frog in the act of leaping, as will be seen by the following quotation:

> A serpent is on the mainland, resting in a coil, hid by a slight depression, and protected by declivities at two points of the compass. While in this position it beholds a frog sitting near the point of land beyond. The serpent unfolds itself glides along the edge of the mainland until it reaches the tongue or spur, drops its head into the declivity, and just as it reaches the highest point beyond, strikes at the frog. But the wily batrachian becomes alarmed, leaps in time, and emits an egg which in turn is injected into the mouth of the serpent.[1]

In 1886 Professor W. H. Holmes[2] published an account of the Serpent Effigy together with a carefully made sketch plan (plate XII, *a*). This agrees very closely with McLean's drawing made the previous year. The forward portion of the effigy, however, not recognized by Squier and Davis or by Professor Putnam, but shown somewhat distorted in McLean's plan as a "frog," is much more carefully drawn and agrees in all essential particulars with the plan and measurements of the present writer. The two lateral pro-

[1] J. P. McLean, *American Antiquarian*, 1885, p. 46.

[2] W. H. Holmes, *Science*, vol. VIII, 1886, p. 626.

jections at the base of the head of the serpent, however, are not shown. He refers to them as follows:

> The minor appended features recognized by Squier and Davis and by some recent visitors, are too obscure to be identified with absolute certainty and I consider it unsafe to introduce them with my illustration.

These appear at the present time as in fig. 15, and although their original outlines are difficult to determine, their junction with the base of the head is clearly shown. These appendages will be discussed more fully later.

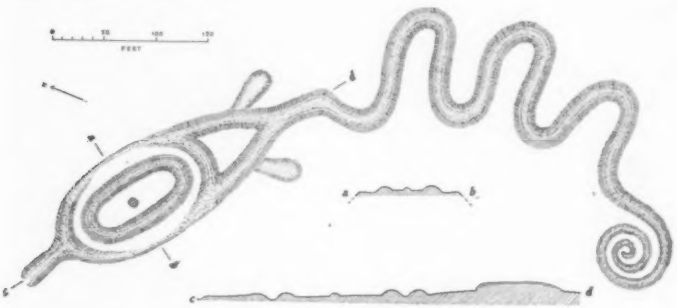


FIG. 15. — Plan and cross-sections of Serpent Mound, Adams Co., Ohio. C. C. Willoughby, 1918.

Professor Holmes, referring to the enlarged portion (the head) of the effigy says:

> Most of the attempts to throw light upon the most extraordinary features of the work have been made through the medium of oriental philosophy; but it is manifestly wrong to go thus out of our way to seek a symbolism for the oval enclosure, as do Squier and Davis, who liken it to the symbolic egg of old-world philosophy; nor need we make a serious effort to combat the idea that the terminal portion is a frog, as suggested by McLean. It would not seem unreasonable that the former feature should be simply the eye of the effigy. . . .

He also refers to the possibility of the oval representing the heart of the reptile. In a recent letter to the writer, however, he says:

> I am decidedly inclined to the view that the oval, instead of representing the heart of the serpent, represents the head and the eye.

Professor F. W. Putnam became deeply interested in the Serpent Mound, and in 1887 through his instrumentality the promontory upon which the earthwork is situated, together with a portion of the surrounding land, was purchased and became the property of the Peabody Museum of Harvard University.

In that year Professor Putnam began his exploration and restoration of the effigy and neighboring mound and graves. The oval, "jaws," and body of the Serpent were measured, and the earth along the edges thrown upon the embankments, which he outlined upon both sides by a gravel walk. This resulted in raising the embankments in some places probably at least a foot and making the base measurement somewhat narrower. A critical study of the measurement previous to the restoration and of the earthworks themselves, seems to show that the original form of the effigy was not materially altered. Following Squier and Davis, however, Professor Putnam saw in the earthwork only the oval and a serpent with open jaws. If the front portion of the effigy recognized by McLean, Holmes, and the present writer, and the projections at the base of the head had also been restored by him, they would be relatively higher and more conspicuous than they appear at present.

After speaking of the prominence of the serpent in the religious faiths of the American Indians, Professor Putnam says:[1]

> Will it be forcing fact to argue . . . that in the oval embankment, with its central pile of burnt stones, in combination with the Serpent, we have the three symbols everywhere regarded in the Old World as emblems of those primitive faiths?

With the view of studying at first hand the special features of the effigy, the writer visited the Serpent Mound in June, 1918, in company with Mr. W. C. Mills of the Ohio Archaeological Society, who now has custody of the Serpent Mound park, and made a careful survey of that portion in front of the first bend of the body near the neck, and also took measurements of various parts of the body to verify those made by Professor Putnam in 1887. Accepting Professor Putnam's figures for the length of the effigy from the western end of the oval to the tip of the tail, measuring along the convolutions of the body as 1,348 feet, the total length of the Serpent

[1] F. W. Putnam, The Serpent-Mound of Ohio, *Century Magazine*, 1890, p. 871.

from the tip of its tongue or snout to the end of its tail is approximately 1,417 feet. The greatest width of the body at present is 24 feet near its junction with the head, and for several hundred feet back of this point it averages 22 feet in width and about 4 feet in height, then gradually tapers to the end of the tail. As already noted, before its restoration the body was somewhat broader and lower. This will be seen by comparing the photograph taken before its restoration, plate XII, *b*, with the recent picture, *c*, of the same plate. These are views in opposite directions.

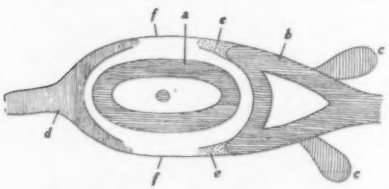
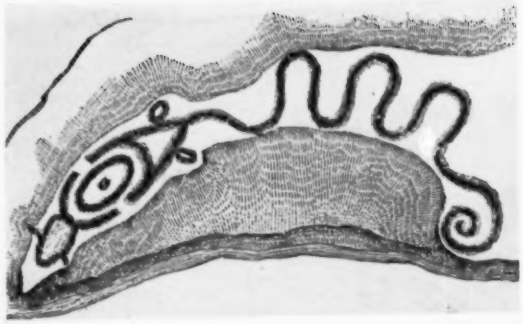


FIG. 16.—Head of Serpent Mound. The parts recognized by different investigators are as follows: Squier and Davis, *a*, *b*, *c*; McLean, *a*, *b*, *c*, *d*, *e*; Holmes, *a*, *b*, *d*, *e*; Putnam, *a*, *b*; Cowen, *a*, *b*; Willoughby, *a*, *b*, *c*, *d*, *e*, *f*.

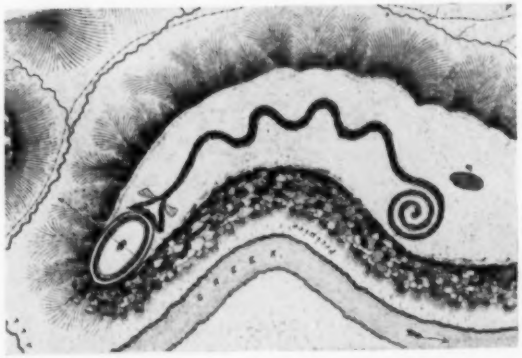
For the sake of convenience the effigy may be divided into two sections, the first of which includes that portion back of the first turn at the neck, and comprises the folds of the body and the coiled extremity. There seems to be no disagreement among archaeologists concerning the interpretation of this portion. The second section consists of the remaining parts of the effigy, which undoubtedly represent the conventionalized head of the serpent lying flat upon the point of land, parts of which have been graded to form a portion of the outline of the head. Figure 16 shows this as it now appears; that portion with the horizontal shading is the part interpreted by Professor Putnam and others as representing an oval in front of the open jaws of the serpent head, which is turned upon one side. This portion was restored by Professor Putnam by throwing upon the embankments the washed earth and accumulated mould along their edges.

A careful examination of the ground, *e*, *e*, in this figure, near the ends of the so-called jaws, shows that these originally projected several feet beyond their present limits. This is indicated by various stones embedded in the soil and the character of the earth at these points; the space covered is shown by the dotted area in



B

D



A

C

THE SERPENT MOUND OF ADAMS COUNTY, OHIO

A, Plan by Squier and Davis, 1848; *B*, Plan by J. P. McLean, 1885; *C*, Sketch plan, Peabody Museum, 1887; *D*, Plan by C. Cowen, 1901.

the diagram. Moreover, in a letter to the writer, Dr. C. L. Metz of Madisonville, Ohio, who visited the effigy several times before its restoration and many times during and since the work was completed, calls attention to this in the following words:

> I am under the impression that the embankments comprising the oval were made somewhat higher and also a little broader at the base than before the restoration, as all the soil was turned back that had been washed or ploughed down from the embankment. The projections at the back of the head (wings so-called) undoubtedly existed in my opinion. Also the "jaws" extended further along the sides of the oval and in the restoration were terminated too abruptly.

Those parts of the earthwork distinguished by vertical shading (*c*, *c* and *d*) are unmistakable at the present time, and if they had been restored by Professor Putnam in common with the rest of the effigy would have been more prominent than they are at present. The original outlines of the projections at the base of the head (*c*, *c*) are difficult to determine but they were probably narrower and higher than they now appear. These were dug into at the time of the restoration of the main body of the earthwork, but as Professor Putnam did not consider them parts of the effigy their contours .re probably not changed materially. Plate X, *b*, is a photograph which shows the neck and base of the head of the effigy, and the projection at the right, taken during the restoration of the neck and base of head. Both projections are at present perhaps a little less than two feet high at their junction with the base of the head. They were considered parts of the effigy by Squier and Davis, McLean, Dr. Metz and the present writer, and they appear on the Museum's sketch plan of Serpent Mound park which was made just before the restoration of the effigy, a portion of which is shown on plate XI, *c*. That part in front of the oval marked *d* in fig. 16 is very prominent and the embankment at its highest point is now but slightly lower than the oval (see cross-section fig. 15, *c-d*). This was also considered a part of the effigy by McLean and Holmes, and is indicated in the sketch plan before referred to (plate XI, *c*).

That portion of the promontory on which the oval rests was carefully graded and the inner ends of the embankments forming

parts of the outline of the head sloped gradually to this grade, which according to the cross-section in Squier and Davis's plate was slightly lower at either side of, and near to, the oval than at the outer edge of the platform (*f*, *f*, fig. 16). This gave the effect of a trench encircling the oval which was very shallow opposite *f*, *f*. The gradual sloping of the inner ends of these embankments to the graded sides of the platform gave the effect of their continuation along *f*, *f*, much reduced in height, which accounts for the somewhat misleading delineation near these points in the drawings of McLean and Holmes. At the present time the space at either side of the oval is nearly level, the cross-section appearing nearly as in fig. 15, *a*–*b*.

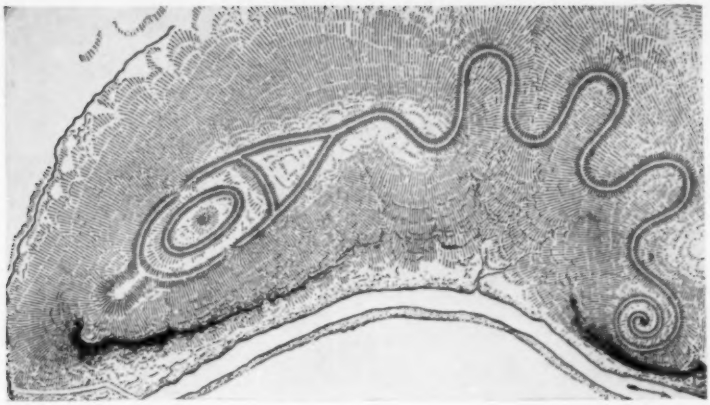
The modifications of this portion of the effigy caused by the restoration of certain of its parts are apparently slight but important, and consist principally of the too abrupt ending of the embankments, *b*, near *e*, *e*, the probable levelling of the graded portions near *f*, *f*, and the change in the relative heights of embankments *a*, *b*, to those of *c*, *c*, *d*. The points *e*, *e*, are restored in the plan of the present writer, fig. 15.

The prominent place occupied by the serpent in the religious life of the American Indians is too well known to be enlarged upon here. He was the god of the upper regions—the four winds and four quarters, and he occurs in combination with the primitive cosmic symbol (the circle with inner cross and central sun circle) or some of its parts, from Ohio southward to Central America. He was Quitzalcoatl, the plumed or feathered serpent of the Aztec, revered by them as the god of fire and adored as the god of the air and four winds.[1] He was known to the Maya as Kukulcan, the divine serpent or divine four, ruler of the four quarters.[2] Among the Hopi he is sometimes known as Palulukonuh and his effigy, the head of which is shown in fig. 17, *g*, appears in the Palulukonti ceremony together with representations of the sun, clouds, thunderbolts, rainbow, etc.

In the South he is usually shown with plumes or feathers, while

[1] Zelia Nuttall, *Peabody Museum Papers*, vol. II, p. 70.

[2] *Ibid.*, pp. 68, 69.



A

B

C

THE SERPENT MOUND OF ADAMS COUNTY, OHIO

A, Plan by W. H. Holmes, 1886; *B*, View taken in 1883, looking southeast; *C*, View taken in 1917 by C. L. Young, looking northwest.

in the North he commonly appears with two to four horns (figs. 17 and 19, *a*, *c*). Figures 18 and 19, *c*, represent him in combination with the primitive cosmic symbol complete or in part.

A very interesting example of the head of this deity is shown in fig. 19, *c*. This is cut from thin copper and measures about thirteen inches in length. It was found with other copper symbols in the great mound of the Hopewell group by Mr. Moorehead in 1891. It is now in the Field Museum at Chicago. It represents the head of the horned serpent in combination with the cosmic symbol.

FIG. 17.—Heads of the horned or plumed serpent from the following sources: *a*, Cincinnati tablet; *b*, Turner group of mounds; *c*, pottery vessel, Alabama; *d*, stone disc, Alabama; *e*, pottery vessel, Arkansas; *f*, pottery vessel, New Mexico; *g*, Hopi Indians, Arizona; *h*, rock carving, Arizona; *i*, Mexican manuscript; *j*, Maya manuscript.

The outer circle of the symbol is compressed to form the outlines of the head. The central circle typifying the sun, and the four radiating arms representing the four directions which join the outer compressed circle or horizon line, are clearly indicated. In many representations of the cosmic symbol a dot or a small circle appears in the center of each of the four quarters formed by the cross. The circles which represent the eyes of this copper head and also the two circles near the base of the head are probably analogous to these. By a comparison with the drawing of the serpent head cut from sheet mica from the altar of one of the mounds of the Turner group, Ohio (fig. 19, *a*), it will be seen at once that the circles and inner projections near the base of the copper head when arranged in their normal positions as indicated in *d*, are analogous to those of the mica serpent *a*. To make this more clear the draw-

ing *b* is furnished, which is made to show the serpent illustrated in *a* as it would appear if viewed from above.

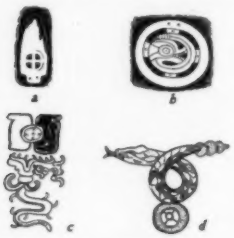


FIG. 18.— Combined serpent and cosmic symbols. *a*, *b*, From graves, Tennessee; *c*, Dresden codex; *d*, Mexican codex.

With the above in mind let us turn to the Serpent Mound as shown in figs. 15 and 19, *e*, *f*. The greater part of the outline of the head is formed by the outer embankments, but a portion on either side of the oval is indicated by the ridge produced by grading the promontory at these points (see cross-section *a*, *b*, fig. 15). It is possible that there may have been some erosion here and that the ridges may have been somewhat higher originally, but much erosion would probably have caused more irregularity than now appears. It is also probable that during the restoration slight changes may have taken place here.

The oval embankment with the central altar of burnt stones where the ceremonial sun fires were undoubtedly kindled are prob-

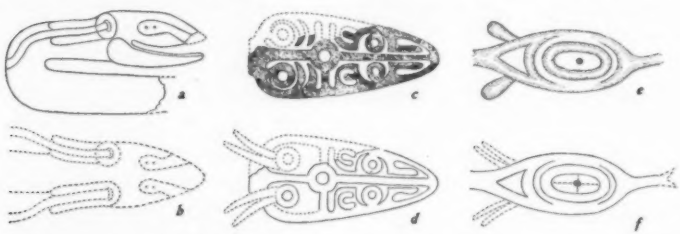


FIG. 19.— *a*, Mica serpent from Turner group of mounds; *b*, as the serpent shown in *a* would appear if viewed from above; *c*, serpent head and cosmic symbol of copper, Hopewell group of mounds; *d*, as *c* would appear had the horns been shown in their normal position and not curved inward; *e*, head of Serpent Mound; *f*, the same with horns and certain other portions tentatively restored.

ably analogous to similar symbols combined with the serpent in figs. 18 and 19, *c*. It is not improbable that a cross of some material occupied the position indicated in fig. 19, *f*. The two embankments projecting from the base of the head undoubtedly were horns arranged somewhat as shown by the broken lines in this figure.

It should be remembered that the embankments forming this effigy have been subjected to disturbances by the hand of man and by nature for many years. Erosion, the uprooting of trees, burrowing animals, and cultivation have all doubtless contributed in obliterating details. The main features of the earthworks, however, are well preserved. It is assumed that the horns, probably four in number and in pairs, now appearing as two low embankments, were once clearly defined. There is no trace of the cross which in all probability was once present within the oval.

There is a space of about thirty feet between the eroded end of what appears to be the tongue of the serpent and the edge of the cliff upon which it rests. For nearly half the distance, beginning at the cliff's edge, the horizontal surface of the rock is exposed and the remaining portion shows considerable erosion. The end of the tongue may have extended farther along this space and may have been forked as indicated in *f*, like the finely formed forked serpent tongues cut from thin copper found in the mound of the Hopewell group, one of which probably belonged with the head, fig. 19, *c*, although it was not joined to it.

There can be no doubt that the Serpent Mound belongs to the same interesting culture as most of the other great earthworks of southern Ohio that have been systematically explored.

Great credit is due Professor Putnam for its purchase and preservation by the Peabody Museum of Harvard University in 1887. The earthwork and the adjoining land was transferred by the Museum in 1900 to the Ohio State Archaeological and Historical Society for perpetual care as a free public park. It is situated about seven miles from Peebles, from which it is easily accessible by automobile.

PEABODY MUSEUM OF HARVARD UNIVERSITY,
CAMBRIDGE, MASS.

A SKETCH OF EASTERN DAKOTA ETHNOLOGY

By ALANSON SKINNER

THE data for the following sketch were obtained principally from Sisseton and Wahpeton informants at Sisseton, South Dakota, during the month of August, 1914, on a field expedition for the American Museum of National History. A little Isanti material was gathered the year before at Portage La Prairie, Manitoba. The works of Lowie, Wissler, Dorsey, Riggs, and Mrs. Eastman also furnished much valuable material, and the writer wishes to acknowledge the valuable assistance of Mr. Amos Oneroad, a Wahpeton, as guide, interpreter, and informant.

Dress.—In costume we find the Isanti and Wahpeton inclining to the Central Algonkian. Anciently the men of both groups banged their hair in front and back and dressed it in four little braids, two hanging over the forehead and two in the rear. The Wahpeton, according to some of my informants, roached the hair at one time; others denied this however. The Isanti and probably the Wahpeton used a headdress made from a woven sash twisted turbanwise about the head, or the deer's hair roach. Warriors who had entered the camp circle of the enemy and escaped alive were entitled to wear the war-bonnet.

Their shirts were of buckskin and fringeless. Their leggings were tight with large ankle flaps. There was a seam in front, down which a short fringe, half an inch long, was fastened. The tops of the leggings were large, with double strings to fasten on the belt. Only the Isanti are said to have worn beaded garters below the knee.

Moccasins were formerly of the soft-soled type, with large ankle flaps like those of the Sauk and Fox. Lately soft-soled moccasins with high extension uppers, on the Ojibwa style, seamed over the instep, are used. The women wore the two-piece Central Algonkian dress.

The Sisseton inclined more toward prairie styles. The men parted their hair in the middle and wore two braids which they wrapped with otter fur. Their shirts and leggings were furnished with exceedingly long fringe, to which scalps or twisted strips of weasel skin were added. They used buffalo robes. Their moccasins were hard soled.

Lodges.—While all divisions, especially the Sisseton, used the buffalo-hide tipi with a three-pole foundation, the Isanti and Wahpeton utilized the square bark house in summer and the round or hemispherical lodge in winter. These latter were sometimes heavily built and earth covered. Presumably, according to my informants, the Dakota never made benches around the inner walls of the latter. These forms are admirably illustrated by Schoolcraft. The various parts of the lodge were named and were used in a formal manner much as among the neighboring forest tribes.

Household Utensils—Pottery. Pottery was made of pounded clay tempered with burnt flint, pounded. The coil process being unknown, the vessel was built up by pinching from a flat bottom. It was stamped on the sides with a paddle. Ears or lugs were placed on it, and it was smeared with glue and burned by use.

Mats made of braided corn husks were used on the floor, and no doubt floor mats of reeds and lodge mats of bulrushes were known, though data are not now available. Corn husks were made into mats by the Delaware and Iroquois, but I do not know of their use in this manner by the Central Algonkian. A specimen was obtained by the writer for the American Museum of Natural History.

Bowls and Spoons.—These were of the typical Central Algonkian type. The bowls, made from knots by charring and scraping, were round or oval and of all sizes. Spoons were made of wood or buffalo horn. The wooden spoons were short handled and broad bowled, like those of the Algonkian. The bowls and spoons used in medicine feasts and dances, especially the *wakan watcipi*, had animal-head handles, and were held as sacred. Types of all these objects were collected by the writer for the American Museum of Natural History. Others are in the Museum of the American Indian, Heye Foundation.

Flint knives, scrapers, and arrowpoints were used, as well as similar objects of bone. A double-pitted pebble hammerstone, exactly similar to those found on ancient Indian village sites all over the east, was obtained in use, together with a rubbing and sharpening stone. Grooved mauls used as hammers, pemmican pounders, and when of large size for bone crushing, were also gathered.

Grooved stone axes were used, but mostly to pound wood on another stone so that it might be broken. A few flint axes were said to have served for chopping.

Mortars and Pestles.—Mortars were made from short sections of logs, and were of the horizontal type common to the Central Algonkian, not the vertical variety of the Southern Siouans. The pestles observed were long heavy sticks, not shaped in any way. This is a cruder style than that of the Central tribes, who made their pestles taper in the center at the grip.

Woven Bags.—The square woven bags of the Central Algonkian made of cedar and basswood fiber were well known. They were formerly intended for all purposes, but now are used mostly to hold medicines. Woven tobacco pouches of Menomini and Ojibwa style, square, and worn around the neck, were used.

Stone Berry Crushers.—Round flat pebbles were used to mash berries and cherries on a flat stone slab. The fruit was dried and mixed with pemmican.

Parfleches.—The Isanti utilized barrel-shaped parfleches, the Wahpeton and Sisseton preferred the flat rectangular and square box type. These were painted with angular figures. Birchbark baskets and boxes are said to have been much used formerly. The Eastern Dakota incline towards the Plains with respect to their abundant use of rawhide. The forest Indians for the most part used very little rawhide, perhaps because they could not obtain buffalo.

Pack straps of the Ojibwa style were usually made of moosehide, with the center piece which passes over the forehead still retaining the hair.

Baby Boards.—These were formerly much used and seem to be

of the same type used by both Plains Dakota and Central Algonkian, judging by old illustrations.

Travois.—No data on the travois were gathered.

Canoes.—Dug-out log canoes are still used by all three peoples—Isanti, Wahpeton, and Sisseton. The last two tribes formerly had many bark canoes.

Weapons.—Bows, often quite long, and arrows tipped with stone, antler, or bone, and rawhide shields were common. The warclub was either ball-headed or flat and shaped like a gun butt. Stone-headed clubs, like those of the prairie Sioux, were probably not used to any extent, unless by the Sisseton.

Agriculture.—Corn, beans, squashes, pumpkins, and some informants say, tobacco, were raised by the Eastern Dakota. There is some question as to the time of their introduction, however. It is possible that these Sioux obtained these things from the whites. Corn is braided and hung on horizontal bars without the lodge, to dry, or it is taken green, roasted, boiled, or cut from the cob and dried, or fried. Tipsina is dug and dried. Pumpkins and squashes were sliced and dried as among the Central Algonkian. Wild rice was formerly much used. Maple sugar was also manufactured.

Picture Writing.—Picture writing on flat board slabs and on birchbark, particularly in connection with hunting charms and the medicine dance, is common. The figures are the familiar semi-realistic mnemonic symbols found among the Ojibwa and Menomini and were no doubt derived from them. All the examples collected by the writer, five in number, were Wahpeton, but several more, in the Museum of the American Indian, Heye Foundation, are Sisseton.

Tanning.—Buffalo robes were tanned with the hair on in regular Plains style. An elkhorn or wooden-handled hoe-shaped scraper was used to remove hair from hides needed for lodge-making. Some Sisseton women marked on the scraper handles in crude etching the number of hides they had dressed, and the number of tipis they had made.

Deer hides were dressed over an inclined log and fleshed in the same manner as by the Northern and Central Algonkian. This

means nothing from a comparative standpoint, as the process was well nigh universal in North America, though not found in the Southeast in quite the same manner.

Musical Instruments.—The deep water drum characteristic of the medicine lodge elsewhere may have been used in the *wakan watcipi*, but ordinarily the tambourine or deeper kettle drum, with one or two heads, was most common. Ceremonial rattles were usually made of sticks strung with deer hoofs, or of deer hoofs cut in fancy shapes and strung to wear about the neck or over one shoulder in dancing. The rattles used in the medicine dance were gourds. Flageolets, often carved with loons' heads, were used for courting, and bone whistles were for war purposes and the sun dance. Metallic jinglers, probably the successors of deer hoofs, were used on clothes and bags as rattles.

Pipes.—Pipes made of the red catlinite were exceedingly well made and abundant, as the Eastern Dakota have controlled the catlinite quarries of Couteau des Prairies from time immemorial. Almost every conceivable type of pipe was probably made by them.

Games.—Among the Eastern Dakota the following games have been noted. All or nearly all are so widely found among tribes of the same and adjacent culture areas that they can scarcely be considered significant.

Icasdohe, or bowling.	Hoop and javelin.
Two variations of snow snake.	Shinney, played by both sexes.
Bowl and dice.	Sliding wands over instep for distance.
Snow arrow.	
Lacrosse.	Tops, darts, coasting on boards.
Cat's cradle.	Kicking game, players kick each other.
Moccasin.	

Except bowling and coasting, I have recorded all these games from the Menomini. The Blackfoot also have the kicking game. Cup-and-ball, according to my informants, was not played by the Eastern Dakota.

Folklore.—The folklore of the Eastern Dakota is in the main strikingly like that of the Central Algonkian. I have observed

many parallels with that of the Menomini. However, the Dakota lack the sacred culture-hero cycle connected with the medicine dance. Many of the Dakota culture-hero stories find parallels rather among the Plains tribes and the Southern Siouans than among the forest peoples. However, a number of concepts occur which seem peculiar to the Dakota of both forest and prairie divisions, and are not found elsewhere. In particular may be mentioned the Double Women (*Wi*^{n}*ya*^{n} *nupapi*), visions of whom force youths to become berdaches, and the Tree-Dweller, a stump-inhabiting dwarf. The Eastern Dakota, so far as my relatively meager information goes, have no beliefs concerning a mythical dwarf race, flying skeletons, night-wandering ogres, nor mysterious bundle-carrying goblins like the Algonkian to the east and north.

Burial Customs.—Perhaps all the Eastern Dakota at one time practised tree or scaffold burial. The Sisseton certainly did and older literature seems to point out that this was sometimes done by the Isanti and Wahpeton. For a long time all have buried in the ground, and I believe it was always customary for part of the Isanti and Wahpeton to do this. Graves were made with little houses above them in the Central Algonkian style. Little information was gathered on funeral and mourning customs, but all were of the Central Algonkian type. The death bundle, containing a lock of the deceased person's hair, and supposed to harbor one of his spirits, was kept, as is universal among the Central Algonkian. Like the Cree and Menomini the Dakota believed each person had two spirits (some say four), one of which, the soul, went to the other world. The soul was supposed to travel to the hereafter in much the same way as the Central Algonkian relate, the trip requiring four days' time, and ending with the crossing of a river, but the incidents of the journey are different and less elaborate. The souls were not supposed to have to cross a bridge.

Mourning Customs.—A lock of hair of the deceased is taken and kept in a bundle which is placed in the rear of the lodge in the sacred place. After a time a feast is given, and a person of the same age and sex of the departed takes the clothes making up the bundle and eats the food. The lock of hair is then buried and the spirit remaining in the hair is thought to leave.

Among the Menomini this custom is also in vogue, and the practices of these Algonkian people throw light on the meaning of the Dakota ceremony, now forgotten. The guest of the same age and sex is supposed to represent the deceased and be animated by his soul released from the hereafter by the keeper of the land of departed spirits for the occasion. After the ceremony, the impersonator of the dead is faced to the west and the soul of the deceased is dismissed to return. The Menomini ceremony is connected with the Medicine lodge.

A distinctly characteristic feature among the Eastern Dakota was the custom of having the society of the deceased, kit-fox, no-flight, or whatever it may be, mourn for him. The Dakota widows mourned four years, and dressed in wretched rags, etc., precisely like the Central tribes. Unlike the Cree, Ojibwa, and Menomini, the Dakota did not carry the body of the deceased out through the back of the lodge.

Naming Customs.—Ordinal names were used, and also personal individual titles. In the scalp dance a man might throw away his name and take that of a dead warrior relative, giving presents to the poor at the same time.

Children were named by their grandparents for some deed done in war, or after a famous ancestor. Guests were invited to a feast, after which the old person named the child, and a crier was sent out to announce it. Gifts were then made. The Bungi branch of the Plains-Ojibwa had this latter custom, but the Central Algonkian differed from it so far as my information goes.

Children's Training and Puberty Fasting.—Young male children were constantly instructed with regard to their future puberty fasts. Later, when the period arrived the boys would retire to the top of a hill and wail all night. Their faces were not blackened as among the Central Algonkian, where, by the way, both sexes fasted. Some youths had their hands tied behind their backs to keep them from running away. Others were bound to four stakes. These customs do not apply to the Central Algonkian.

Among the Central tribes dreams were generally of some of the great fundamental mythic powers of the universe, the sun, morning-

star, thunder, moon, horned snake, or underneath bear or panther. The Dakota dreamed of the ordinary bear, buffalo, elk, *unktehi* (underneath snake or panther), and Tree Dweller. Those who dreamed of the Double Women usually became berdaches.

The Central Algonkian could reject a dream three times, the Dakota must take what came to him at first. Generally, the "spirit" appeared to him as a man and went away in its true animal shape, although sometimes it never assumed an anthropomorphic form. Among the Central Algonkian the great cosmic powers generally appeared as idealized men, but when animals came, as they did, rarely, they always came in their own shapes.

It is believed some Dakota had a prenatal existence on earth and knew their guardians before they were born, having met them when wandering over the world as disembodied spirits. This is not a Central Algonkian idea, though the Menomini believe some children are incarnated strong powers and under their protection from birth, especially in the case of those descended from the thunderbirds.

Marriage.—This was arranged for the young people after they had met secretly. The groom's father or an old man hired by him acted as go-between; and the girl was ceremonially taken to the groom's lodge riding upon a fine horse. On the way the youth's brothers met her, assisted her to dismount, and carried her back in a blanket. Reciprocal gifts and feasting followed. Marriage by simple elopement also occurred.

Dances and Societies.—The Eastern Dakota had a number of military societies of the Plains type. Each of these was characterized by its own peculiar costume and rites, generally including the no-flight vow for the officers. The officers usually carried lances either straight or crooked, and other regalia. Through the writings of Wissler and Lowie these societies are well known and the reader is referred to the Anthropological Papers of the American Museum of Natural History, volume XI, for descriptions of them. For the purposes of this paper the writer will merely enumerate these and other societies and roughly point out their affiliations.

Military Societies of the Plains type: Tokana, No-Flight, Mawatani, Raven Owners, Badgers, Owl Feather Wearers.

Social Societies of the Plains type: Omaha.

Societies and Dances found among the Central Algonkian: Buffalo Dance, Medicine Dance.

The latter dance deserves more than mere passing mention. While externally it resembles the Ojibwa and Central Algonkian Midewiwin, its organization and ritual are of a very different order, placing it with the Iowa, Oto, and Winnebago. It is perhaps intermediate between the Omaha and Ponca and Central Algonkian types. The coyote dance resembles the Winnebago woman's dance. The heyoka clowns are found among many Plains tribes.

A certain number of peculiar cults and dances seem to be decidedly original with the Eastern Dakota, a few are found among both Eastern and Western divisions but among no other peoples. These organizations and dances are: Elk Ear, Thunder, Elk, Double Women, Bear, Raw Fish Eaters, Dog Liver Eaters, Yumini Watcipi, Mocking Dance. The Eastern Dakota bear dance resembles the Central Algonkian ceremony of that name only in its title.

Social and Political Organization

According to the latest information, gathered by the writer in South Dakota all three major bands of the Eastern Dakota were subdivided into exogamous patrilineal gentes, each of which had its place in the tribal camp circle and each of which had its own civil officers. Marriage within the gens was tolerated after a special ceremony, but this was rare indeed. The Sisseton were divided into nine groups nicknamed for traditional peculiarities; the Wahpeton into six, mostly named from the localities where they lived; and the Isanti into six groups named for their chiefs. None of these bands were given animal names like the gentes of other tribes, instead their titles were more like the band names of the Plains peoples. Much confusion has been made by the varying fortunes of some of the gentes, especially among the Isanti, where first one gens then another has been most popular and important, and the name of the division changed accordingly, the band being called for each gens which became predominant. Finally, the Isanti band prevailed and gave its name to the group.

Government.—Each gens had its own group of twenty *wakicun* or councilors who had a tent of their own. In the tribal camp circle each councilor's tent was pitched in front of the place occupied by his gens. For matters of tribal importance the councilors of all gentes got together. All the councilors had equal authority and each gens voted as a unit. They had a herald who announced their decisions. The chief's office was hereditary in later years, but formerly men achieved the honor through wisdom and prowess. Perhaps there were no chiefs before white advent. On all occasions except when in tribal council the chief had no authority over the councilors; in the tribal council he was supreme. Each chief had his own "head soldier" or *akitcita* (Lowie's data make it four instead of one) who was his agent in all affairs, and who held office for life. Some at least of the older Dakota believe that much of their political organization was due to French suggestion, at least so far as the coalition of the different tribes was concerned.

The *akitcita*, known as "soldiers," or "police," were individuals selected for their bravery and not entire military societies chosen for the purpose at different times as among the Teton Dakota. Occasionally, this may have been done among the Sisseton, and according to Lowie, among the Wahpeton, but the society, generally the kit-foxes (Tokala), seems never to have had full rights. In other words, the Eastern Dakota more nearly resembled the Algonkian and Southern Siouan than the Teton in this respect. The akitcita performed the typical acts of soldier killing, had their separate tipi, and their challenging contests, etc., in regular Plains style.

A man became *akitcita* or eligible for service after having performed any one of a certain number of specified deeds of valor, such as counting coup, killing or scalping a foe or rescuing a friend. The greatest deed of all was to perform one of the series before having spoken to any young woman save his sister. All these deeds entitled the performer to some special insignia. The war-bonnet was given a man who succeeded in penetrating the enemy's camp circle.

Conclusion

An analysis of the culture of the Eastern Dakota shows that the Isanti and Wahpeton divisions seem intermediate between the Forest and Plains peoples. In material culture they are almost wholly of the Woodland type, especially do they resemble the Central Algonkian. On the other hand, other aspects of their culture represent a mixture. In social and political organization they incline toward the prairie tribes, or at most toward the Southern Siouans, ceremonially they are either original or like the prairie people, with a smattering of Algonkian influence, especially as regards hunting customs connected with medicine and charms, and bark and board pictographs. While possessing a form of the medicine dance it seems, so far as our present knowledge goes, to resemble more closely the phase found among the Southern Siouan than the typical Central Algonkian.

The Sisseton show a stronger relationship with the Plains. This perhaps is due to their geographical position, for they were farther from the forest and its influences than were either Wahpeton and Isanti, and less in contact with the Central Algonkian. In costume, lodges, subordination of agriculture (although even the Yankton raised some corn), in fact respecting all points of material culture, forest influences were weaker, and socially, politically, and ceremonially they were more strongly inclined to the Plains.

The Isanti and Wahpeton may perhaps be considered typical intermediate tribes, whereas the Sisseton, like the Ponca and Omaha, and the Plains-Cree, have crossed the transition line and are just on the border of true Plains culture.

Museum of the American Indian,
Heye Foundation, New York

A UNIFORM BLANK OF MEASUREMENTS TO BE USED IN RECRUITING. A PLEA FOR THE STANDARDIZATION OF ANTHROPOLOGICAL METHODS[1]

By FABIO FRASSETTO

AMONG the many problems which for some time past await a satisfactory solution, there is one which demands, and I believe fully deserves, your earnest attention and coöperation. It is the problem of the standardization of anthropological measurements, which includes also that of the method of expressing the measurements numerically; a problem which may to some appear insignificant, but which really is of high scientific and practical value.

It is well known to all of you that standardization of anthropometric measurements is urgently needed, and that, at the International Congresses of Monaco in 1906, and Geneva in September of 1912, a satisfactory agreement for craniometry and cephalometry and anthropometry was reached. But it must also be recognized that for the measurements of some parts of the body, an agreement in practice is yet to be attained. We see, in fact, that for the thorax, for the pelvis, and for the other parts of the skeleton, the measurements vary, as much for the number as for the points of reference which distinguish them one from another, and for the manner in which they are made.

For the thorax, for instance, some authors take only two diameters, others four, others six; and in regard to the antero-posterior diameter, it is taken at the level of the nipples or at the level of the fourth rib, or at the level of the jugulum, not at the level of the basis or apex of the xiphoid cartilage, making the measurement

[1] This paper was read before Section H of the American Association for the Advancement of Science at the Baltimore Meeting, 1918, by Prof. Fabio Frassetto, Professor of Anthropology, University of Bologna, Italy, Temporary Attaché, Royal Italian Embassy.

sometimes with the compass held horizontally, sometimes with the same held obliquely.

Furthermore, in the measurements upon the living subject, the inaccuracies in technique and in the instruments used is added to the defects already indicated for skeletometry.

Thus, for instance, in making the measurements of the biacromial diameter, which all anthropologists advise, errors are made, varying from 10 to 30 millimeters; errors which, given the shortness of the distance to be measured, are not admissible, so much so that that they moved Parson, who recently studied this measurement, not to use it any longer, and to substitute a measurement taken at the upper part of the deltoid muscles.[1]

These and other uncertainties which we regret in the field of scientific anthropometry and which are rather serious, become even more so and more numerous when we examine the technique followed in the fields of applied anthropometry and in other kindred fields by persons not sufficiently dexterous in anthropometrical technique. We find, then, that the obstetrician measures one just born in a fixed way and with fixed instruments, which are not exactly the same as those used by the anthropologist. We find that at one's puberty the hygienist does not conform entirely to the data of a rigorous anthropometry; and that the military surgeon does the same, when one presents himself for the duties of the draft; to say nothing of the clinical doctor, who wishes to discover, through the anomalous proportions of the parts of the body, the reasons for a diseased state. And let us not speak of anthropometry practised upon the living subject for artistic purpose, nor of that practised upon the cadaver by the anatomist.

Now, having in mind the fact that one of the indispensable phases through which the scientific method must develop is precisely *comparison* (by means of which are known, enumerated, and also valued quantitatively and qualitatively resemblances and differences among objects) and that one of the principal aims of *external anthropometry* (setting aside *internal and intermediate*

[1] Parson (F. G.), Biacromial Breadth—On the Proportion and Characteristics of the Modern English Clavicle. *Journal of Anatomy*, London, 1910, li, 71–93.

anthropometry) is that of establishing the proportions among the various parts of the body in the different ages of individuals so as to utilize them not only for their racial but also for the diagnosis of their individual constitution; having all this in mind, many comments are not needed to demonstrate the impossibility of using seriously all the measurements gathered by such different persons with such a diversity of technique and of instruments. And then, why persist in this false way if it does not lead to any useful result? Why waste so much time and money to arrive at nothing; and still worse, to spread, under the false appearance of scientific truths, serious errors and false concepts, to the damage of science itself and of society?

From such a deplorable state of things results the greatest urgency to face and to solve the problem of the revision and of the standardization of anthropometric measurements; the more so, since the solution of this problem is strongly urged everywhere, and especially in the United States, in England, and in Italy; in which nations there has recently been manifested a certain anthropological activity in connection with the war, as much in the studies for the physical well-being of soldiers, as in purely scientific studies. Now, the results of such studies and of other eventual studies which might be made, would be in themselves not very fruitful, could they not be compared with one another; and since, speaking scientifically or socially, as you will, such comparisons are indispensable, there can be no doubt whatever as to the necessity of instituting a uniform blank of measurements to be used in recruiting. But to attain this useful end, there is imposed from the beginning the necessity of a perfect accord upon the method of numerical valuation for anthropological measurements; that is to say, the solution of the first of the two problems mentioned.

It is well known that scientific measurements are expressed by means of two principal systems: the *metric system* and the *English system*. It is further known that while the first has for some time been used in all the nations of the world, the second is still generally used—but not by all—in England, in the United States of America, and in Canada. Nevertheless, it must be remembered that in the

war, just closed, in England, and especially in the United States, very great progress has been made toward the general adoption of the metric system, towards which end will have contributed not a little the decision taken by the War Department General Order for adopting the metric decimal system in all operations of the war of the American Army fighting in Europe.

WAR DEPARTMENT,
WASHINGTON, January, 1918.

The metric system has been adopted for use in France for all firing data for artillery and machine guns, in the preparation of operation orders and in map construction. Artillery and machine gun material intended for service abroad is being graduated accordingly. Instruction in the metric system will be given all concerned. The sights of the infantry rifle and the automatic rifle will be left unchanged.

(003.11, A.G.O.)

By order of the Secretary of War.

TASKER H. BLISS,
General, Chief of Staff.

OFFICIAL
H. P. MCCAIN,
The Adjutant General.

This wise decision of the War Department is for all of us an encouragement and a spur to the hope that in the fruitful works of peace there may be attained the desired agreement upon the adoption of the metric system in making measurements for the recruiting in American and English armies and in all anthropological researches. Especially so, if the proper offices of the American and English Departments of War and Navy will continue the work already very successfully started during the war for all the operations of the war, and if all those American and English colleagues who may not as yet have followed in their anthropological researches the above-mentioned system, used, in fact, already for some time by not a few of their compatriots, will also do the same. The question therefore of the desired institution of a uniform blank for measurements to be used in recruiting is based on the solution of this first problem.

Assuming that an agreement has been reached upon the problem of which we have just spoken, let us now pass to that more general

one in regard to the standardization of anthropological methods. The necessity of coming to an agreement upon this most important and fundamental problem has been explicitly manifested on several occasions, especially for that part which concerns the anthropometric technique and nomenclature in general; and we ourselves have treated this in the accounts of the *Anthropological Atlas of Italy* made in 1909 and 1910 on the occasion of the third and fourth reunion of the Italian Society for the Progress of Science, and also at the International Anthropological Congress held at Geneva in 1912 and on still other occasions.[1]

Today when anthropological researches are being greatly developed and accomplished with rigor of procedure, and are developing largely in the field of practical application, the necessity of a standardization of anthropological methods is more keenly felt. For this reason we hold it to be opportune to call the attention of the anthropologists and of the psychologists here assembled to this question of fundamental importance, so that from now on may begin those studies which should lead in the best way and in the least time to the attainment of our object. Since, however, the study which we propose to undertake is a study of preparation, it cannot result in definite perfection; and, with the progress of our science, adjustments and additions will have to be made afterwards, in order to obtain a methodology always more perfect and always more in accord with the perfecting of instruments and with the new facts, which from time to time will be discovered, correcting or confirming, as is the custom to do in the most progressive scientific methodologies.

But since such a task appears very complex and full of difficulties, a wise counsel will be the institution of a permanent International Executive Committee, in which may be duly represented the schools fitted to give rigorous and at the same time also practical direction to our science.

Practical steps towards the formation of such a committee have already been taken at and after the reunion of the 18th International

[1] See F. Frassetto, *Lezioni di Antropologia*, Seconda Edizione, Milano, Hoepli, 1918, and particularly *Atti. Soc. Ital. Progresso Scienze* vol. 3, 1909, and vol. 4, 1910.

Congress of Americanists at London in 1912, on which occasion an International Committee of Anthropologists was established with Professor Marett, of Oxford, as Secretary.[1] The work of the committee was interrupted by the war.

Such a committee should superintend the careful unfolding of the whole program of work; that is to say, it should gather and coördinate the various ideas and propositions both its own and those which would be formulated by the various anthropologists into a blank which should express in the best possible way the logical systematization of anthropological methodology according to the actual state of our knowledge, anthropological as well as scientific in general. This grave task might be facilitated and simplified, should subdivision of the work be attained in such a way that each of the single members of the aforesaid committee might give his contribution to those arguments in which his own competence and aptitude in treating them were recognized. I leave, however, to the initiative of the committee which will be nominated the establishment of the manner of organizing the above-mentioned subdivision of the work and I bring my appeal to an end, expounding briefly in a decalogue in which are shown the fundamental criteria which, according to our judgment, should serve as guides for the unification of anthropological methods.

Such a decalogue, the ample and complete development of which I shall give presently, is the following:

I. Anthropological researches should have a double purpose,—scientific and practical.

II. The method to be adopted should be the inductive method, this should be metric and descriptive and should include the study of the internal organs and the organs of sense.

III. Work should be done, in so far as possible, upon well-determined and sufficiently numerous material.

IV. The selection of measures and of points of reference, should be based upon morphological and physiological criteria.

V. The system for expressing anthropological measurements should be the metric decimal system.

[1] *Proc. XVIII, Internat. Cong. Amer.* London, 1912, vol. I, LXXXVI.

VI. Anthropological measurements should be taken with a properly selected set of instruments and according to uniform methods; they should always be expressed in centimeters, and in the case of measurements between symmetrical points these should always be determined by working from the left side. A minimum amount of admissible error shall be determined for each measurement.

VII. Anthropological nomenclature in general, as also that for measurements, should be scientific, simple, and should be expressed always in the Latin language. It is to be recommended that non-specialists use also their own language.

VIII. The original measurements should always be set down in full, and should be elaborated according to strict statistical methods. The selection of indices and of the categories into which they may be grouped should be made, in so far as possible, on the basis of comparative morphologic and morphometric criteria.

IX. All graphic reproductions (photographs, designs, etc.) should always have the same orientation for the same parts of the body; they should not be under a size to be determined by subsequent agreement, and in so far as possible, there should be a wider use than now prevails of radiography, of chromophotography, and of stereoscopic photography.

X. The synthesis of numerical and morphological data should be made according to the method of diagrams and maps; and the grouping of anthropological units as well as their geographical distribution should be made according to the principles of *varieties*, *species*, *genera* . . . , as is the custom in zoölogy and in botany.

Having thus arrived at the end of our communication and returning to the theme with which we started—that of the institution of a uniform blank of measurements for recruiting—we formulate the wish that the proposition which we made today in this memorable assembly be received with general favor, to the entire advantage of the progress of science and of social well-being.

ROYAL ITALIAN EMBASSY,
WASHINGTON, D. C.

THEODOOR DE BOOY

By MARSHALL H. SAVILLE

IN the death of Theodoor de Booy, American archaeology has lost one of its most enthusiastic workers and field explorers.

Mr. de Booy died from the effects of influenza at his home in Yonkers, N. Y., February 18, 1919. He was the son of Vice-Admiral C. J. G. and Mary (Hobson) de Booy, and was born in Hellevoetsluis, Netherlands, December 5, 1882. He received his education at the Royal Naval Institute of Holland. In 1906 he came to the United States, becoming an American citizen in 1916. In 1909 he married Miss Elizabeth Hamilton Smith, of Louisville, Kentucky. In company with his wife, Mr. de Booy went to the Bahama Islands in 1911, and during his residence there became interested in the antiquities of the Caicos group of the Bahamas, devoting much time to the exploration of their numerous caves and mounds. On his return to the United States, Mr. de Booy published, in 1912, the first results of his archaeological researches in a paper entitled "Lucayan Remains on the Caicos Islands." He then determined to devote his life to the subject, and the opportunity soon presented itself, when he became attached to the Heye Museum, now the Museum of the American Indian, Heye Foundation, of New York City. Mr. de Booy joined the staff as field explorer for West Indian work, and sailed for the Bahamas in June, 1912, remaining there for six months. He was notably successful on this trip, among the most important objects recovered being a remarkable paddle which he discovered in a cave on Mores island. Mr. de Booy's next expedition was to Jamaica, where he spent the months of January, February, and March of 1913, on this trip conducting excavations in some of the kitchen-middens found on various parts of the island. During July to October of the same year he devoted his attention to Santo Domingo, there undertaking the first systematic exploration ever made in this important and

little-known field, a work which was continued in the spring of 1914. On his return to the United States, Mr. de Booy prepared a report on the results of the two expeditions, which were devoted chiefly to the exploration of certain caves in Santo Domingo and to work on the small island of Saona. In October and November of the same year he made an archaeological reconnoissance of eastern Cuba, and was the first to discover the great riches of this hitherto neglected field. The year of 1915 was a busy one with Mr. de Booy. The months of February to April were spent by him in exploration and excavations on the island of Margarita, Venezuela, and from May to September he was occupied in excavating in the southeastern part of Trinidad. In 1916 Mr. de Booy made a third trip to Santo Domingo, and in the same year he visited Porto Rico and Martinique. On all of these islands he conducted excavations.

Owing to the acquisition of the Danish West Indies by the United States, Mr. de Booy was sent by the Museum to the islands comprising this group, where he remained from October, 1916, until February, 1917. This was the first archaeological work ever done there, and he was notably successful in obtaining material and information respecting the antiquities of this region. With this expedition his fieldwork for the Museum came to an end. Early in 1918 he severed his connection with it, and commenced preparations for an exploration of the unknown region of the Perijá mountains in eastern Venezuela, and an investigation of the ethnology of the Motilone Indians, the savage remnant of a tribe which has always kept their country free from white settlement and exploration. This journey was made under the auspices of the American Geographical Society and the Museum of the University of Pennsylvania, of which latter institution he became a field worker for a short period. After his return from this trip, Mr. de Booy joined the force of the State Department Inquiry, as one of its South American experts, and was still engaged in this work at the time of his death.

One of the most active and prolific investigators in archaeological and geographical research, Mr. de Booy had reached the point where the future held promise of still greater and more valuable results. His genial and pleasing manners made for him

many friends at home and abroad, and his early passing is a distinct loss to this branch of scientific endeavor. With commendable industry he prepared reports immediately after each expedition, and at the time of his death was engaged on a comprehensive book describing the region of his latest activities. His collections and writings find a place in the front rank of West Indian exploration, and our knowledge of the ancient history of the Antilles has been greatly enhanced as the result of his entering this field. A list of his most important publications follows:

1912. Lucayan Remains on the Caicos Islands. *American Anthropologist* (N. S.), vol. XIV, no. 1, January-March, 1912, pp. 81–105, 18 figs. pl. VI.

1913. Lucayan Artifacts from the Bahamas. *American Anthropologist* (N. S.), vol. XV, no. 1, January-March, 1913, pp. 1–7, 5 figs. Reprinted as *Contributions from the Heye Museum*, No. 1.

Certain Kitchen-middens in Jamaica. *American Anthropologist* (N. S.), vol. XV. Reprinted as *Contributions from the Heye Museum*, No. 3.

1915. Pottery from Certain Caves in Eastern Santo Domingo, West Indies. *American Anthropologist* (N. S.), vol. XVII, no. 1, January-March, 1915, pp. 69–97, figs. 12–28, pls. IV–IX. Reprinted as *Contributions from the Heye Museum*, No. 9.

Certain West-Indian Superstitions Pertaining to Celts. *Journal of American Folk-Lore*, vol. XXVIII, no. CVII, January-March, 1915, pp. 78–82. Reprinted as *Contributions from the Heye Museum*, vol. II, no. 3.

The Cradle of the New World. *Bulletin of the Pan American Union*, March, 1915, pp. 311–319, 5 illustrations.

1916. Certain similarities in Amulets from the Northern Antilles. *Holmes Anniversary Volume*, Washington, 1916, pp. 24–30, 3 plates.

Notes on the Archeology of Margarita Island, Venezuela, *Contributions from the Museum of the American Indian, Heye Foundation*, vol. II, no. 5, pp. 1–28, figs 1–15, pls. I–VIII.

Island of Margarita, Venezuela. *Bulletin of the Pan American Union*, vol. 42, 1916, pp. 531–546.

1917. The Birthplace of Josephine, Empress of France. *Bulletin of the Pan American Union, April, 1917*, pp. 493–498, 5 illustrations.

The Virgin Islands of the United States. *Geographical Review*, New York, vol. IV, no. 5, 1917, pp. 359–373, 9 figs.

Indian Petroglyphs in the Antilles. *Forward*, Philadelphia, vol. XXXVI, nos. 17–18, April 28, May 5, 1917, 6 illustrations.

Archeological Investigations in the Virgin Islands. *Scientific American Supplement*, No. 2180, October 13, 1917, pp. 232–234, 9 illustrations.

Eastern Part of the Dominican Republic. *Bulletin of the Pan American Union*, September, 1917, 7 pp. 5 illustrations.

Archeological Notes on the Danish West Indies, etc. *Scientific American Supplement*, No. 2189, December 15, 1917, pp. 376–377, 8 illustrations.

The Town of Baracoa and the Eastern Part of Cuba. *Bulletin of the Pan American Union*, Nov. 1917, pp. 627–639, 9 illustrations.

1918. Certain Archeological Investigations in Trinidad, British West Indies. *American Anthropologist* (N. S.), vol. 19, no. 4, October-December, 1917, pp. 471–486, figs. 61–64, pls. III–VIII, Reprinted as *Contributions from the Museum of the American Indian, Heye Foundation*, vol. IV, no. 2.

The Turks and Caicos Islands, British West Indies, *Geographical Review*, vol. VI, no. 1, July, 1918, pp. 37–51, 6 figs.

The Virgin Islands; Our New Possessions. Joint author with John B. Faris. J. B. Lippincott Co., Philadelphia, 1918. 292 pp., 97 illustrations, 5 maps.

The People of the Mist. An Account of Explorations in Venezuela. *The Museum Journal of the University of Pennsylvania*, vol. IX, nos. 3–4, September-December, 1918, pp. 183–224, figs. 45–63.

An Exploration of the Sierra de Perija, Venezuela. *The Geographical Review*, New York, vol. VI, no. 5, November, 1918, pp. 385–410, 15 figs.

The Western Maracaibo Lowland of Venezuela. *Geographical Review*, New York, vol. VI, no. 6, December, 1918, pp. 481–500, figs. 1–13 pl. XVII, large folded map.

Noises in Baracoa, Cuba. *Forward*, Philadelphia, vol. XXXVII, no. 3, Jan. 19, 1918, 3 illustrations.

Buried Treasure in the West Indies. *Forward*, Philadelphia, vol. XXXVII, April 13, 1918, 3 illustrations.

The Fragrant Island of St. John. *Forward*, Philadelphia, vol. XXXVII, March 2, 1918, 3 illustrations.

Martinique, its Inhabitants, Cooks, and Sportsmen. *Forward*, Philadelphia, vol. XXXVII, Feb. 21, 1918, 3 illustrations.

A Strange West Indian Industry. *Forward*, October 19, 1918, 1 illustration.

1919. On the Possibility of Determining the First Landfall of Columbus of Archaeological Research. *The Hispanic American Historical Review*, vol. II, no. 1, February 1919, pp. 55–61.

Tropical Versus Arctic Exploration. *The Scientific Monthly*, May, 1919, pp. 433–436.

The following are unpublished.

Santo Domingo Kitchen-midden and Burial Mound.

Virgin Island Archeology.

Notes on the Archeology of Eastern Cuba.

The Unknown Perija Mountains of Venezuela and Their Inhabitants.

A book to be posthumously published.

NEW YORK,
March, 1919

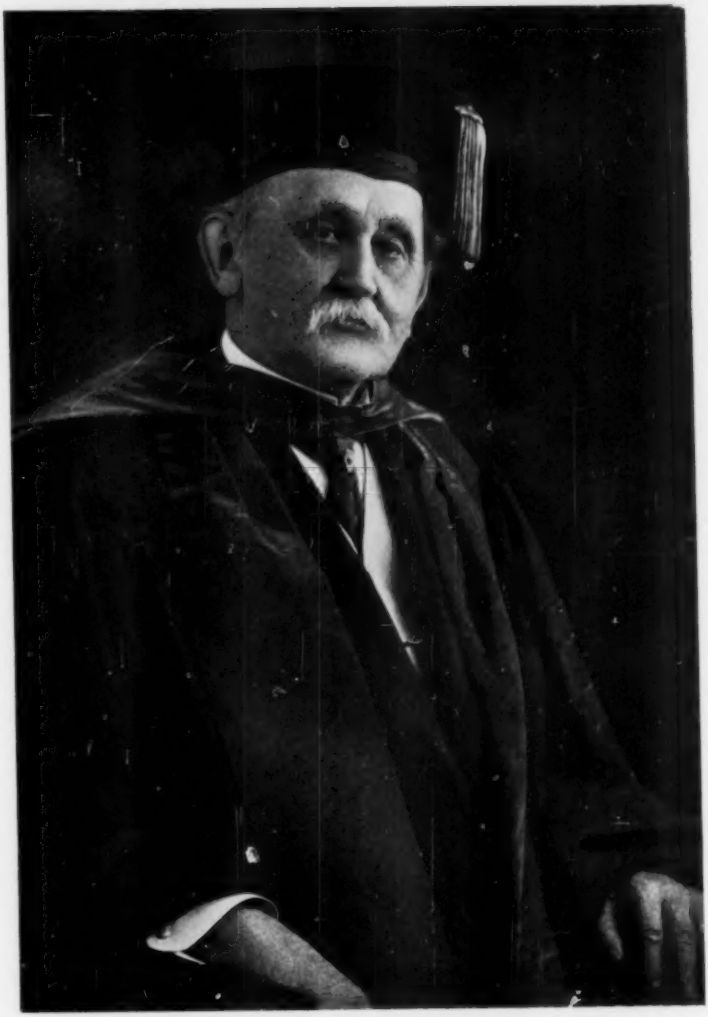
DR. FRANK BAKER

By JOHN R. SWANTON

ALTHOUGH primarily a biologist the subject of this sketch, whose death occurred on September 30, 1918, was one of that group of Washington students who were instrumental in laying the foundations of the science of Anthropology in America, and he is deserving of particular notice in this journal since he was Chairman of the Editorial Committee having in charge the publication of the original *American Anthropologist* from 1893 until 1898 when it gave place to the present organ. The following account of his life and activities is compiled from a memorial sketch by Dr. Fielding H. Garrison, printed in the *New York Medical Journal* for November 16, 1918, and information contained in the resolutions on his death adopted by the Faculty of the Medical Department of Georgetown University of which he was Vice-President.

Doctor Baker was born at Pulaski, N. Y., in 1841. His ancestors came from Gloucestershire, England, to New England where they took part in the Revolutionary war. His schooling was private and local, but his father, Thomas C. Baker, was a man of wide reading. Immediately on the outbreak of the Civil war he enlisted in the Thirty-seventh New York volunteers and served until 1863 when he was transferred to Washington, where he later entered the government service and began the study of medicine. Sept. 13, 1873, he married Miss May E. Cole, of Sedgwick, Me., who survives him together with six children, one of whom, Col. Frank C. Baker, was a member of the medical corps in the U. S. expeditionary army in France.

In 1880 Doctor Baker received the degree of M.D. from Columbian (now George Washington) University. In 1883 he became Professor of Anatomy in Georgetown University, D. C., and continued to occupy the chair until his death, a period of thirty-five



DR. FRANK BAKER, 1841–1918

years. This institution conferred upon him the degrees of A. M. (1888), Ph.D. (1890), and LL.D. (1914). To his active coöperation and counsel as a member of the building committee, the University is largely indebted for the present building of the medical school completed in 1886.

Having entered the U. S. Life Saving Service, he became Assistant Superintendent in 1889. In 1890 he was made Superintendent of the National Zoological park and retained this position until 1916, when advancing years caused him to resign.

Doctor Baker was one of the founders of the local anthropological (1879), biological (1880), and medical history (1913) societies. He was president of the Association of American Anatomists in 1897, of the Anthropological Society of Washington, 1897–1898, and of the Medical History Club of Washington, 1915–16, and for twenty-one years (1890–1911) secretary of the Washington Academy of Sciences. As stated above he was Chairman of the Editorial Committee of the *American Anthropologist* (old series) from 1893 to 1898. He was a member of several societies in addition to those above mentioned.

Among the various literary activities of Doctor Baker may be mentioned the following. He was one of the collaborators of Billings's *National Medical Dictionary* (1890), supplied the definitions of anatomical and medical terms in *Funk and Wagnalls's Dictionary*, and contributed several monographs on regional anatomy to the *Reference Handbook of Medical Sciences*. His first contribution to medical literature comprised two papers on President Garfield's case (1881–82), in which he showed that the wound was caused by the second bullet and correctly diagnosed its course in a well-accredited diagram made two days after the event. This was followed by a number of papers on anatomical and anthropological subjects, the most notable of the former being *The Rational Method of Teaching Anatomy* (1884), *What Is Anatomy?* (1887), *Some Unusual Muscular Anomalies* (1887), and *Nomenclature of Nerve Cells* (1896). Doctor Garrison states that "his monograph on the *History of Anatomy* published in *Stedman's Handbook* compares favorably with the well-known article of Sir William Turner (*En-*

cyclopaedia Britannica), which has remained the ranking contribution in English," and he also says that "since the death of the later Dr. Robert Fletcher [another prominent founder of the Anthropological Society of Washington], he was probably the most erudite physician in Washington." His later publications were devoted mainly to studies connected with the history of anatomy and medicine.

Doctor Baker's anthropological work was confined to his earlier years, his principal contributions to anthropological literature being the following: Anthropological Notes on the Human Hand, *American Anthropologist* (o. s.), Washington, 1888, vol. I, pp. 51–75; The Ascent of Man, *American Anthropologist* (o. s.), Washington, 1890, vol. III, pp. 297–319; Primitive Man, *American Anthropologist* (o. s.), vol. XI, pp. 357–366.

BOOK REVIEWS

METHODS AND PRINCIPLES

The Mythology of All Races: vol. XII. *Egyptian*, W. MAX MÜLLER; *Indo-Chinese*, Sir JAMES GEORGE SCOTT. Marshall Jones Co., Boston 1918. xiv, 450 pp.

In this last text-volume of Dr. Gray's valuable series, Egyptian mythology occupies pp. 1–245 and Indo-Chinese the rest of the volume. In pp. 432–450, the editor furnishes a bibliography that on the Egyptian side makes no claim to completeness but contains all the necessary material. The bibliography of Indo-Chinese mythology is very short, but doubtless exhaustive.

It seems best to begin with a discussion of the latter part of the volume because little more can be said about it than a statement of its contents. Sir James Scott speaks of the peoples and religions of Indo-China, their myths and legends, their festivals and finally of the thirty-seven *Nats*, who, it seems, are only thirty-four. It is not pretended that the mythology of Burma and Tonkin is influential or important. On the contrary, the author points out frequently that the material of these stories is often derivative and the conceptions involved puerile. But he has put together a number of interesting facts, recondite because little known, and valuable for purposes of comparison. And he has furnished his account with nineteen large plates, most of them highly colored, which tell almost as much as any text could do of the nature and character of these curious spirits, called *Nats*. The colored plates are all taken from Temple, *Thirty-Seven Nats of Burma*, a book on which this account largely depends.

Much the more valuable portion of the volume is the brief examination of Egyptian mythology by Professor W. Max Müller. Professor Müller is one of the two most distinguished Egyptologists in America. He writes with the fullest and most direct acquaintance with the sources and presents the mature result of thorough research and long reflection on all phases of the life of ancient Egypt. It would be difficult to overrate his equipment or competence. And, in spite of its short compass, his presentation is one of the best that have ever been published.

As a matter of fact, it is much more than an account of Egyptian mythology. It is a highly significant and suggestive study of Egyptian

religion. That was inevitable from the nature of Egyptian mythology. Greek mythology, in the form we generally know, is largely the result of direct and often determinable poetic creation, quite irresponsible and only loosely associated with religious thinking and acts. Not so Egyptian myths. We know them largely from liturgies, and from the figures and cult-actions that they are meant to explain. That is, they form an integral part of Egyptian religious activity and cannot be dissociated from it.

In one other respect, the study of Egyptian mythology is a different thing from the Greek mythology, which is much better known and almost immediately comes to our minds first when the word mythology is mentioned. The Greek stories are concerned with persons who have a definite individuality even for us. That individuality is somewhat deceptive. It is due to an artificial selection on the part of later grammarians and mythographers who have suppressed contradictions and provided continuity and sequence where those elements were lacking. Closer study reveals a confusion of forms and functions that are usual in polytheism, but any examination of Greek mythology has the inestimable advantage of proceeding from a "textus receptus" to which it is possible to attach variants.

In the Egyptian myths, on the other hand, there is no such established basis of comparison. The functions of one god are assimilated with extraordinary readiness to those of another, in cult, or prayer or legend, so that, in most cases, it is in the highest degree difficult to establish definite lineaments for any one of them. It is only in the case of the Osirian cycle, very fully discussed in Chapters V and VI, (pp. 92–128), that we seem able to detach marked personalities from the mass of confused detail that is presented in most accounts, and, we may suspect, that this fact is due to causes similar to those that have given Greek myths their apparent cohesion.

This lack of definite personalities, this confusion of details and functions, was taken to be an indication of the essentially pantheistic nature of Egyptian religion. Many of the scholars who held this view were quite unconsciously animated by the century-old awe with which western Europe had regarded the mysterious divinities of the Nile. Especially when the Rosetta stone seemed to furnish the key to the long locked inscriptions, imaginative men were certain that the rending of the veil of Isis would disclose a new insight into the universe. Quite naturally they found what they expected to find. Even first-rate investigators were prone to attach a philosophic depth and universal meaning to the

stories they unrolled from the papyri and this fact, together with the tendency of men to over-estimate the value of the subject matter with which they habitually deal, gave a fundamentally wrong conception of Egyptian spiritual life.

Against this view, there was soon advanced the other one—which might be termed that of common-sense—that Egyptian myths were precisely what they seemed to be, that the stories were crude because the ideas which they expressed were crude, and that so far from representing a profound and philosophic pantheism, they were the natural expressions of a primitive animism ossified into something like a system by sacerdotal tradition. That was the position of Maspero and it is whole-heartedly urged by Professor Müller. The argument is clearly stated, and, to my mind, quite cogently.

But the book is in no sense argumentative or polemical. There is a deal of matter given, so much, in fact, that one of the important functions of the series, that of furnishing material for reference and comparison, is admirably preserved. This is done, not merely in words, but largely by the many illustrations from the monuments—a procedure practically unavoidable in any study of Egyptian mythology. There are further a few typical texts, and an alphabetical list of the gods outside of the Osirian cycle.

The author then deals in an authoritative way with the difficult theoretical questions involved in the worship of animals, in magic and in Egyptian conceptions of the future life. The last chapter discusses the development and propagation of the Egyptian religion.

More than sixty pages of notes, which themselves often contain additional material of high value, close Professor Müller's book.

The value of the book in contents and methods has been sufficiently indicated. It is for that reason unfortunate that certain mechanical defects make it hard to use. There is in the first place no index, not even the briefest one. This, for a book which offers so much, is a serious omission. No doubt, in a work of this nature, the preparation of a complete index was very difficult, but an indifferent or incomplete index is still much better than none at all. Further the notes are made difficult to consult for lack of the simplest of all devices, *viz.*, some indication at the top of the page of the chapter to which they belong or the page on which the annotated passage appears.

There are small points at which issue might be taken, less with Professor Müller's statements than with the unqualified form in which they are made. The official etymology of Sarapis may well have been

Osor-hap (p. 386, no. 19), but the balance of probability is still in favor of his Sinopean origin. Nor does it seem to me proper to say that the "Isiac mysteries" exercised less influence on the classical mind than did those of Cybele or Mithra (p. 121). It is easy to exaggerate the depth to which Mithraism penetrated ancient society, in spite of Renan's dictum. Isis, denationalized somewhat and syncretized into unrecognizability, but still retaining much of her Egyptian external attributes, was a real competitor of Christianity, as Professor Müller admits (p. 242). One might add to the references he gives the famous passage of Apuleius, Met. XIII, i–vi, and such Greek papyri as that of Oxyrhyncus (Ox. Pap. XI, 1380).

It is to be hoped that this short treatise is the forerunner of a fuller systematic account of Egyptian religion and mythology.

MAX RADIN

AMERICA

Kutenai Tales. FRANZ BOAS. Together with texts collected by ALEXANDER FRANCIS CHAMBERLAIN. Bureau of American Ethnology, Bulletin 59, Washington, 1918.

Like most of Professor Boas's work, this volume contains far more than it seems to at first sight. There are nearly three hundred pages of mythology given in both Kutenai and English. Part of this is in interlineated text plus accompanying free translation in English. The larger half of the collection is in solid text, with the translation at once literal enough to be of service to the linguist and sufficiently idiomatic in English to be readable and of ready use to the mythological student. The inconspicuous indication in the English translation of the lines of the Indian makes possible a very close correspondence between the two versions for those who are interested, without disconcerting the reader who cares only about the substance of the story.

Thirty pages of abstracts and comparative notes set a new example for work of this kind. It has long been customary to accompany collections of Indian tales by summaries. Very often however these summaries have been of undue length. Then, comparative references have usually been appended to the tales themselves, instead of the summaries. Dr. Boas's abstracts are unusually compact. They gain farther by having the several versions of the same myth brought together, instead of following the accidental order of their presentation. The comparative references are added as footnotes to the abstracts, where of course they properly belong. They are very full, perhaps vir-

tually complete. It has too often been the practice for an author to insert allusions to such comparative material as he happened to be familiar with, and not to trouble himself to bring together that which was less conveniently assembled. An unusually concise method of reference allows Dr. Boas to list his comparisons both in brief compass and most usable form. Another device which helps is the indication, along the margin, of the page on which each episode of each abstracted myth occurs.

The last part of the volume is a vocabulary which consists of forty pages of Kutenai-English stems and grammatical elements, and thirty pages of English-Kutenai. While making no pretense at a formal presentation of the language, the character of the material in the Kutenai-English list is such as to make it clear that it contains most of the essentials for a grammar. Of course it need hardly be said the two vocabularies together permit of a quite searching analysis of the texts.

Altogether this publication sets a standard of masterly workmanship which can only be appreciated on examination. As a model of thoroughness, efficiency, and utility which cannot fail to be followed or at least striven after in future work along similar lines, it is certain to be of the utmost importance.

A. L. KROEBER

The Diegueño Ceremony of the Death Images. EDWARD H. DAVIS. (Contributions from the Museum of the American Indian, Heye Foundation, vol. v, no. 2, pp. 1–33, pl. 1–5, 1919.)

Mr. Davis of Mesa Grande, well known for his long and intimate association with the Diegueño and adjacent tribes of "Mission Indians," has given in this paper the closest eye-witness description of what is easily the most important single ceremony of the southern half of native California, the mourning anniversary in its full form, with images representing the dead. His story makes more concrete our knowledge of this ritual as it is known from the accounts of Waterman and DuBois for the Diegueño and Luiseño, Stephen Powers for the Yokuts, and Dixon for the Maidu. Several features that characterize the ceremony wherever it is practiced in California indicate that it originated in the south and has spread northward. The attention bestowed by the Diegueño on the images—there is one for each deceased member of the "clan" holding the festival, whereas farther north only prominent people are honored with a figure—corroborates this inference. A number of new points are established by the author: as, the use of images by the Yuma, and the ceremonial recognition in the rite of hereditarily inimical clans—whose

part in the usages of the southern Californians more and more appears to have been surprisingly large. The Heye Museum is to be congratulated on obtaining through Mr. Davis a set of images which, inasmuch as they were made for an actual ceremony, although in a sense an artificial one, have less of the model about them than any in other museums.

A. L. KROEBER

The Aztec Ruin. EARL H. MORRIS. (Anthropological Papers of the American Museum of Natural History, vol. XXVI, pt. I, pp. 1–108, 13 figures, 1919.)

This is a report on the material cu'ture of the people who built what is now known as Aztec ruin in the Animas valley, San Juan drainage, northwestern New Mexico. It is based on the splendid series of specimens recovered in the excavations by the Museum expedition in 1916 and 1917. The author's writing is to be commended for compactness, lucidity, and sense of proportion. Every class of object found is mentioned, but never at undue length, and the significant traits are brought out quietly and deftly. The process of manufacture is neatly reconstructed so that the description never becomes mechanical. Mr. Morris's chronology allows for two periods of black-on-white pottery at Aztec, Chaco canyon, and Mesa Verde, plus an earlier pre-Pueblo or formative era at Mesa Verde. The latest of these periods of the upper San Juan region synchronizes with the first of the five established by Kidder and Nelson for the Rio Grande. This gives seven time strata for northern New Mexico, Aztec ruin falling into the third, the end of the black-on-white age in which the Pueblos were shifting across the continental divide from the San Juan to the Rio Grande.

The edifice itself is only cursorily touched upon, and as excavation was resumed in 1918 after the completion of this paper, farther publication is to be expected on the subject.

A. L. KROEBER

Eine geographische und ethnographische Analyse der materiellen Kultur zweier Indianers ämme in El Gran Chaco (Südamerika). ERLAND NORDENSKIÖLD. Vergleichende ethnographische Forschungen. I. Göteborg, 1918.

Under this title we have a noteworthy analytic study based upon the facts of culture distribution in South America. The author takes as his specific problem the analysis of the material cultures of two Gran Chaco stocks, the Choroti and the Ashluslay, both of which were visited by him

in 1908. He sets himself the problem of determining just how much of the material cultures manifest among these stocks is original with them. He gives his answer in statistical form by tabulating the traits now observable that were introduced by white people. Under another head are grouped the traits derived from the Andean cultures. Again, there are traits attributed to the extreme south of the continent and others from the Amazon area. To attain these distinctions the author studies the distributions of each important trait separately: thus, we have chapters on houses, furniture, burden-bearing, hunting, weapons, fishing, costume, etc. There are some twenty of these chapters covering quite exhaustively the whole range of material traits. For each important trait a distribution map is given showing all the localities in South America where the trait is known to occur. In all, there are forty-four of these maps. A general perusal of these will of itself give an adequate idea of the continental ranges in material traits. For example, the map for finger-stamped pottery shows that it is localized around the La Plata drainage. What is the connection then, between this pottery and that of the Atlantic coast of North America? If they are historically related, how can their respective isolations be accounted for? Almost every one of the forty-four maps will be found equally stimulating.

A number of striking parallels between the Chaco culture and that of the North American Plains have been noted before, but here we find some new ones, such as the use of a feather fan, forked-stick fire tongs, a particular form of hairbrush, and a hoof rattle. Aside from the pottery parallels just cited, we find the husking-peg of the Woodland Indians.

However, the author does not stop with the exposition of these trait distributions, but proceeds to compare and analyze them. In this way he readily isolates a number of traits that are peculiar to the Gran Chaco and so probably originated there. Of course, he does not attempt to explain the parallels to North American cultures we have cited, his attention being given exclusively to the South American continent. Thus he finds that out of a possible fifty-three traits the Chaco group can claim uniqueness in twenty-four. For the southern part of the continent there are twelve parallels out of a possible forty-four. From the Amazon area the number of parallels is small, the manioc complex, carrying appliances, and weaving are about all that one can be sure of. From the Andean region comes a long array of traits, thirty-five out of a possible fifty-eight; there is practical identity in clothing, ornamentation, and toilet traits, but also close parallels in agricultural traits, weapons, and handy tools. Finally, there is a residuum of traits as to whose origin no conclusion can

be drawn. These are, in the main, traits of very wide distribution in the New World, such as maize, bows, tobacco, bola, sling, fishing tackle, fire stones, gourds, tattooing, head deformation, pottery, etc. This is not really a failure of the method for its functioning depends upon our ability to isolate the respective distribution areas for the several traits. When the distributions are very extensive we must take the whole world as our comparative base and when the distribution is itself world-wide only archaeological evidence as to chronology will suffice.

Finally, the author applies the analytic method to Chaco culture itself, finding reason to believe that it was originally homogeneous with the hunting culture of Patagonia and that the later changes were largely due to the intrusion of traits from the north and the stimulus these conditions exerted upon the development of the Choroti and the Ashluslay stocks. Whatever may be the merits of this conclusion, the author deserves commendation for the precision of his method, and for presenting us with what is by far the best work on the distribution of South American traits.

CLARK WISSLER

The Central Arawaks. WILLIAM CURTIS FARABEE. (Anthropological Publications, vol. IX, University of Pennsylvania, The University Museum.) Philadelphia, 1918.

In "*The Central Arawaks*" we are given the first important publication after long years of travel and study in little-known parts of South America by Dr. William Curtis Farabee. The large tribe known as the Wapisianas is taken as the type of the group of Arawak tribes, that inhabit the Savannah country of British and Brazilian Guiana, at the heads of the Essequibo and Branco rivers. Other tribes are the Atarois, now absorbed by the Wapisianas, and the Tarumas and Mapidians, the last-named tribe being farthest removed from the routes of travel. Material and social culture, somatic characters and language are presented and there is, in addition, a long series of photographic plates, of fine quality.

The Central Arawak are a sedentary people who raise the manioc, maize, sweet potatoes, pumpkins, peppers, etc., of pre-Columbian days and the bananas, plantains, sugar cane, etc., that have been brought into the New World by the white man. They are also skilful hunters and fishers, using bows and arrows, spears, blowguns, etc., for game, and for fish a variety of interesting traps and poisons. One conical basket trap is so set on a springy pole that it flies upward out of water when a fish enters and the trigger is sprung. The poisoning of pools in the dry season

's a communal enterprise. A list of twenty-four poisons that stupefy fish is given for the Wapisianas alone. Canoe-making is seen at its best. The largest canoes are dug-outs with raised sides but light bark canoes are also used. Weaving includes baskets, hammocks, loin cloths, aprons, etc. Carrying baskets, sieves, and basket tubes are similar to those seen among the Carib Indians of British Honduras (formerly of the Island of St. Vincent) and are part and parcel of the widespread cassava complex, along with grating boards set with angular stones. Cotton is used in weaving cloth and hammocks as well as a number of other fibers. Pottery is made.

Lands are cleared at the end of the dry season and planted just before the beginning of the rains. The calendar is fixed by the rising of certain stars with the sun. Thus the first clearings begin with the heliacal rising of Orion, the last trees are felled when Sirius comes up and corn is planted when the Capabara constellation (Aries) is in the east. Star lore is pretty highly developed with all the tribes of the South American lowlands. The observation on heliacal risings gives, of course, an astronomical year. And yet there appears to have been no special knowledge of the movements of the planets (see also, Walter E. Roth, Animism and Folk-Lore of the Guiana Indians, *Thirtieth Annual Report, Bureau of American Ethnology*, pp. 260–261). The comparison that Dr. Farabee makes between the star groups of the Old World zodiac and the constellations known to the Wapisianas shows a number of correspondences.

It is to be regretted that a more detailed and analytical study of decoration was not given even if this subject had already been treated in popular fashion and for the entire Amazon region by Dr. Farabee.[1] A few hints regarding the archaeological remains that must exist in this region would also have been welcome. The Arawak appear to have been one of the great culture-bearing stocks and that they were not incapable of developing striking originality may be seen from their works in Porto Rico, Santo Domingo, and eastern Cuba. Some members of this stock occupied territory contiguous to peoples of high civilization in Peru and Colombia. It has been the fashion to disassociate the problems of language affiliation from those of culture affiliation, but no one can refuse to admit that tribes speaking languages of the same stock have an unavoidable historical bond. When these tribes are distributed over half a continent the historical questions involved become of prime importance.

[1] Decorative Arts of the Amazon, *The Museum Journal of the University of Pennsylvania*, vol. IX, pp. 59–71.

Among the Central Arawak marriage is exogamic as regards the village, but endogamic as regards the extended family, since a boy normally marries one or more of his cross-cousins. Civil organization is but slightly developed and there are no great chiefs. The medicine men have considerable power but religion is at low ebb as far as ceremonies are concerned. The mythology is rather full. Dr. Farabee closes his work with tables of somatic measurements and with word lists from the various dialects.

HERBERT J. SPINDEN

ASIA

The Turks of Central Asia in History and at the Present Day. An ethnological Inquiry into the Pan-Turanian Problem, and Bibliographical Material relating to the Early Turks and the Present Turks of Central Asia. M. A. CZAPLICKA. Oxford, Clarendon Press, 1918. 242, pp. 1 map.

The history and ethnology of the Turkish group of Central Asia belongs to the most complex and difficult problems of Asiatic history. Right from the beginning we are confronted with numerous, diversified tribes; and names and empires change almost from century to century. The best source-material is contained in the Chinese annals and other Chinese records,—the only available material for the knowledge of the early Turkish tribes. In the middle ages we receive as contemporaneous documents the Turkish inscriptions of the Orkhon and subsequently Arabic, Persian, Armenian, and Byzantine authors, with minor sources in Tibetan and Mongol. The discoveries of ancient ruins and manuscripts in Turkistan have completely overturned the knowledge of the preceding generation; but the largest portion of this new material is not yet elaborated, and for this reason and many others in addition no specialist would venture at this moment to write or to rewrite a history of the Turks. Meanwhile, however, there are several new facts standing out clearly. At the earliest time and down to the second century B.C., the great mass of Turkish tribes were settled in what is now southern Mongolia, and there exclusively. Their occupation of Turkistan was an act of gradual conquest and an accomplished fact only at the end of the fourth century A.D. Prior to the process of turkicization, Turkistan ("land of the Turks") was Iranistan ("land of the Iranians"), the bulk of the population being Iranians of various tribes, intermingled with other peoples of the Indo-European family, who spoke a language more closely related to the European than the Asiatic branch. For years our science

had suffered from the delusion of a once widely extended and powerful ancient Turkish civilization: this dream has been shattered since the new discoveries in Turkistan. This civilization, as the Iranian element in Turkistan was then not known, was ascribed to the Turks, but in fact must be credited to Iranians and other Indo-Europeans from whom the invading Turks simply adopted it. In Turkistan, the Turks merely appear as usurpers of an alien culture, and have hardly added anything new to it (cf. *Sino-Iranica*, p. 233). The former overvaluation of the historical importance of the Turks led to a sort of pan-Turkish movement in science, which peopled with Turks almost the whole of Asia and stamped as Turks, even without any reason, numerous tribes placed on record by the Chinese; many of this category, in fact, belong to the Iranian family. The name "Turk" as the designation of a tribal organization properly so-called first appears in the Chinese annals about the middle of the sixth century A.D. in the form T'u-kiüe (thus in modern Chinese), which is intended to transcribe a plural Türküt.[1] Simultaneously, the name "Turk" appears as Turushka in India. All previous speculations in regard to an earlier occurrence of this name in classical and Iranian literatures are failures, and must be rejected. Above all, the Persian name "Turan" is not connected at all with "Turks," phonetically or historically; on the contrary, the peoples of Turan were also of Iranian extraction. The contradistinction of Iran and Turan, first prominent in the Shāhnāme (completed in A.D. 1010), refers to the sedentary population of Iran proper and the nomadic tribes at the outskirts of and beyond Iran, who were likewise Iranians. To attribute the name "Turk" to the Avesta is an absurdity, as at the time of the Avesta there were no Turks within or anywhere close to Iran. The five-page notice of E. Blochet (*Le nom de Turc dans l'Avesta*) to which our author attributes so much importance, but which no one else has taken seriously, is nothing but a chain of errors and sophisms; the less said about it, the better. For the wrong application of the term "Turanian" with reference to Turks, Mongols, etc., we have to thank the poetic imagination of Max Müller; but I do not know that, as stated by the author, the term has become so deeply rooted in European books on Asia, that there seems to be no hope of abandoning it. I have pursued the literature of this subject for twenty-five years, and do not remember that during this period any reputable scholar ever spoke or wrote of Turanian languages or peoples. In fact, this term is generally tabooed. The establishment of

[1] Cf. Pelliot, *T'oung Pao*, 1915, p. 687, especially here referred to, as not utilized by the author and not cited in the bibliography.

a group of "Turanian Turks" (p. 47) appears to me unfortunate. If the modern political pan-Turkish movement, as the author assures us, mainly depends on this catchword "Turanian," it is surely as frail as a spider-web.

The scientific character of our journal forbids me to do justice to the political aspect of the book, and a discussion of this nature would hardly be compatible with my own taste, which does not relish politics. On the other hand, the political background of the book does not prevent me from appreciating what is good and useful in it. In fact, it contains much that is good, and there are many views and theories to which I am ready to subscribe. The author's observations on the *tamga*,—crests and property-marks of the families—and on the *uran* or war-cries, are as novel as interesting; and her exposé of the ethnography of the Turks is excellent and a valuable contribution to the subject, backed up by a wide reading in Russian literature. There is also a good, though brief, survey of the archaeology of Siberia, chiefly based on Tallgren's recent publication (*cf.* this volume, p. 78); and the author's conclusion appears to me right, that both the bronze-age and iron-age people of the Yenisei were of Turkish origin. Her assumption of Iranian influence on the culture of the Siberian bronze age likewise meets with my own views. The author does not attempt to reconstruct the original form of Turkish culture prior to Iranian contact; nor is there a discussion of such generally interesting problems as the share of Turkish tribes in the domestication of the horse and the camel, their influence on the development of costume, their rôle of cultural mediation between East and West (for instance, in the dissemination of cultivated plants and flowers), and their not insignificant position in the history of commerce.

The historical portion of the book is less satisfactory, chiefly because the author relies too much on "authorities," who in well-informed circles are hardly regarded as such. The etymologies and speculations of E. H. Parker and E. Blochet, for instance, are to be taken with utmost caution, and should better be disregarded by one who cannot check their statements in the original documents. An outcome of the pan-Turkicism mentioned above was to claim the ancient Yüe-chi or Indo-Scythians as a member of the Turkish family. The author repeats this outgrown dogma, but tries to replace it by another no less fortunate. It seems to her that "they were a Tung-hu tribe surrounded by Turkic people, with whom the Chinese confused them" (p. 64). The Chinese are not guilty of any such confusion, and have never characterized the Yüe-chi as Tung-hu or as Turks. If the Chinese endeavored to conclude an alliance

with the Yüe-chi against the Hiung-nu, they did so for the very reason that, as they knew perfectly well, the Yüe-chi were a *genus humanum* radically distinct from Turkish hordes. In fact, the Yüe-chi, as well demonstrated by their culture and the scanty remains of their language, were Iranians, closely allied to their northern branch, Scythians and Sogdians. The Hakas, or as spelled by the author, Khakas, cited five times, have never existed, save in the imagination of some writers, and have been relegated to the scrap-heap for some time (*cf. T'oung Pao*, 1916, p. 370); this monstrosity is simply the result of the misreading of two Chinese characters which are intended to transcribe the name of the Kirgiz. The letters sent by the Mongol Khans of Persia to the King of France in 1289 and 1305 are not written in the Uigur language (p. 27), but in Mongol (*cf. Revue orientale*, 1907, p. 192); the alphabet used in these documents is identical with that of the Uigur. Under Uigur literature, the important fact of the discovery of Buddhistic writings in Uigur translations, several of which have already been edited, should have been worthy of mention. The statement that the Uigur are first mentioned in Ptolemy (p. 67) is somewhat surprising, but the name alleged to occur in Ptolemy is not given. Reference is made to "Serica, Liber IV, p. 16, 3." This is obviously a second-hand quotation; it is a common experience that hardly ninety per cent of those who quote Ptolemy have ever consulted or seen an edition of his works. Of course, Ptolemy has never written a book under the title *Serica*, but in his work on Geography, he devotes a chapter to Serica in Liber VI, ch. 16, while his Liber IV deals with the countries of northern Africa. Now, in that chapter, there is but one tribal name which an imaginative mind might correlate with the Uigur,—the Ithaguri; but for phonetic and geographical reasons, this identification would surely be impossible.

The bibliography which occupies more than half of the book is a valuable addition and testifies to great industry, though it is far from being complete. We miss, for instance, N. Pavlov's History of Turkistan, in Russian (Tashkent, 1910); K. Inostrantsev's critical bibliographical study of Hiung-nu and Huns (in *Zhivaya Starina*, 1900), and Pantusov's important investigation of the notices of Central Asia by the Arabic geographers (Kasan, 1909). Under the name of F. v. Schwarz, his *Alexander des Grossen Feldzüge in Turkestan*, which is also of ethnographical interest, should have been mentioned. Huth's decipherment of the Mahaban inscriptions is not referred to, but these monuments are important as the only relics we thus far have of the language from the empire of the so-called Western Turks. Schott's numerous contributions

to the subject are but very incompletely recorded. Of E. Drouin, a few reviews and minor articles are quoted, but not his *Mémoire sur les Huns Ephthalites* (*Le Muséon*, 1895), nor his still valuable contributions to *La Grande Encyclopédie* (1894). Ujfalvy's *Mémoire sur les Huns Blancs* (1898), E. Blochet's *Inscriptions de Samarkand* (1897), and F. Grenard's *Specimens de la littérature moderne du Turkestan* (1899), would likewise be worthy of notice. J. Marquart's *Osteuropäische und Ostasiatische Streifzüge* (not noted) is a source-book of fundamental importance which no one interested in Turkish history can afford to neglect. Under R. Karutz, his book *Von Lübeck nach Kokand* (1904) and *Ethnographische Wandlungen in Turkestan* (*Archiv f. Anthropologie*, 1904) might have been added. J. Peisker, *Die älteren Beziehungen der Slaven zu Turko-Tartaren und Germanen* (1904), a very important study, should have been noted. K. Shiratori is not only the author of a paper on the inscription of Kül-tegin, but also of interesting studies of the Hiung-nu and Wu-sun languages. Chinese and Japanese literature is not placed on record. If the author had gone through the sets of our oriental journals (chiefly *Journal asiatique*, *T'oung Pao*, *Keleti Szemle* or *Revue orientale*), this would doubtless have resulted in numerous valuable additions. As the bibliography stands, it is serviceable only to a student who has some acquaintance with the field, and let us add, has access to Russian publications. In England and the United States such students are few, and even those who read Russian may lose the chance of a lifetime ever to be treated to the *Proceedings of the Turkestan Circle of the Friends of Archæology of Tashkent* or to the *Memoirs of the Ural Society of Friends of Science of Yekaterinburg*. What the ordinary mortal and the student in quest of information need is a well-selected bibliography of pedagogical character, which may serve him as a guide, which tells him briefly what a book contains; what to read, and what not to read; or, what to read first, second, and third; or, what is essential, and what is of secondary importance. The author has the material and the ability to prepare such an educational book-list for the benefit of her own classes and others, and it is hoped that we shall be fortunate enough to receive it some day. For this scheme I would recommend to follow an arrangement according to subject-matter, as the student naturally is interested in problems, not in an alphabetic register of authors whose names he will hardly know; say, for example—prehistoric archæology, historic archaeology (inscriptions, palaeography, *tamgas*, etc.), documents, and source-books of Turkish history (to be separated from general works or monographs on special subjects of history), racial history and physical

anthropology, social organization, folklore and literature (collection of texts, grammars, dictionaries, linguistic relationships, etc.), ethnographical materials, art (with a special chapter on rugs and rug-weaving, so important in Central Asia), etc.

Miss Czaplicka occupies a unique position among the ethnologists of England: she is the first who, on the basis of actual research in the field, endeavors to introduce there accurate knowledge of the peoples of Siberia. Her appointment as lecturer in ethnology in the School of Anthropology at the University of Oxford is a gratifying event. The mission assigned to her assuredly is important, and there is no doubt that she will continue to fulfill it to the best interest and for the true advancement of science.

B. LAUFER

The History of Philippine Civilization as reflected in Religious Nomenclature. A. L. KROEBER. Anthropological Papers, (American Museum of Natural History, vol. XIX, pt. II). New York, 1918.

In this paper Dr. Kroeber applies the statistical method to the analysis of religious words used by the several Philippine peoples, in order to determine to what extent they may shed light on the cultural relationships, for, he says,

> A specific religious element held in common by two nations, is obviously the result of their having at some time come under a common cultural influence. Among such elements, names are the best indices. Rites or beliefs become modified, or may be only partially similar, so that information must be detailed before they can be adjudged as belonging to one or to more classes. Names, after their dialectic alteration is allowed for, are either the same or wholly different. Distinctly proper names, such as the designations of deities and ceremonies, are particularly valuable, since their original identity remains beyond suspicion even when their meaning changes radically.

As the first step in this study he analyzes the material given in Blumentritt's *Diccionario mitológico*, and finds that there are forty-three religious terms common to several Philippine tribes and groups. By expressing, in figures and tables, the terms shared by these groups he determines that:

> (1) The Igorot group is sharply marked off from all other peoples on the islands. Practically all the terms shared by any Igorot tribe with any other tribe are shared with other Igorot tribes; and with them only. (2) All the other groups do not fall into well-defined classes. All seem to possess certain elements in common; the degree to which they share or fail to share these with each other is proportionate to their distances from each other.

A further study of the Blumentritt data confirms further the uniqueness of the Igorot group, but it is notable that the uniformity in their religious nomenclature is greater than in their religious conceptions or practices. Despite the fact that

> their religious terms are almost all peculiar, their beliefs are much more similar to those of the other Filipinos, and their ceremonial acts very nearly identical.

It is also found that while the Igorot tribes tend to share proper names this is not the general condition as regards designations of rituals and ceremonial apparatus.

To the Blumentritt material Dr. Kroeber next adds the more recent data, in order to compile a list of the chief deities, the Igorot cycle of hero-gods, leading ceremonies, ritual motives and religious mechanisms—including in this division the altars, spirit-houses, omen birds, priests or mediums, and intoxicants used in ceremonies. From these considerations he finds

> it is clear that nothing like any organized cult (other than Mohammedanism or Christianity) nor even a single ceremony as definitely unique as the Sun dance of the Plains or the Hamatsa of the Northwest Coast of America, is traceable through the Philippine Islands or any considerable portion of them.

While there is similarity throughout the Islands, it is still true that Filipino rituals have remained in the category of customs. They are not a part of a formulated system, nor are they at all the expression of "religion" in our sense of the term. This apparently is as true for the ancestors of the Christianized tribes as for the pagan groups.

> The conclusion is therefore unavoidable that it is unlikely that any wave of Hindu or Asiatic propaganda, or even any direct Hindu cults as such, have ever reached the Philippines.

Influences have come to the Islands from India and possibly from the Mediterranean, but these have penetrated as disjected fragments, not as organized wholes. The use of Chinese jars in religious ceremonies is considered as illuminative of the cultural relations of the Philippines in general. Despite the fact that they flowed in for centuries they did not affect either the color of native religion or the native pottery industry. They were used in a specifically native setting without any accompaniment or attached associations.

In the final section devoted to the native terms, the author considers Blumentritt's list of non-Malayan religious words common to several Philippine tribes. Five Sanskrit and one Mohammedan words are tabulated, and from their distribution he concludes

that Hindu influence direct enough to cause the introduction of Hindu nomenclature has not penetrated northern Luzon, but that over the remainder of the Islands it has been approximately uniform in strength.

Part II is devoted to comparative considerations, to determine how the findings from religious nomenclature will stand with reference to the broader findings regarding Philippine race, speech, and civilization generally.

As regards race, the author finds that aside from the Negrito, there are two types of brown people in the Philippines and that these types, while apparently rather closely related, are demonstrably distinct; and that their diffusion probably occurred in successive periods. To the earlier division he assigns the tentative names Indonesian, or primitive Malay, or less Mongoloid, and he finds that this type occurs in greatest purity among tribe after tribe in the mountain districts of northern Luzon, that is in

precisely the habitat of the pagan Igorot tribes which the foregoing discussion has shown to be the most unique of all Philippine peoples in their religious nomenclature.

The survey and classification of the languages does not reflect any line of division between Indonesian and Malayan types, or between Igorot and non-Igorot groups. It is evident that

something making for unusual diversification of speech has been at work in northern Luzon, while everywhere else in the Islands something tending to comparative uniformity with only minor local variability. In short, the evidence of language does not correlate well with that of racial type, but does partly correlate with the findings made in the field of religion in the present paper

A survey of the culture results in the conclusion that it cannot be resolved into several distinct layers; it is possible, however, to make

a review of internal local relations which may correlate with our findings as to religion and language, even if they do not explain cultural significance of race movements or relate very closely to the main waves of culture influences.

The outstanding phases of Philippine ethnology are the fundamental unity of culture of all the peoples, coupled with an endless variety of irregularly localized detail.

The one fact of organization on a geographical basis that seems in any way to emerge conspicuously is the comparative separateness of northern Luzon.

To substantiate this claim, Dr. Kroeber tabulates fifteen instances in which the Igorot differ from the bulk of the tribes. Among these are, the absence of tooth-filing and blackening; the absence of blow-pipe,

armor, head-scarfs indicative of bravery, a native script and the barangay system of social organization. On the other hand the Igorot have almost exclusive claim to tattooing (except for the Bisaya), to the head-axe, to a distinctive type of shield, to head-hunting, and to true irrigation terraces. Hence it appears that a line of some cultural significance can be drawn between the Igorot and non-Igorot nations, much as it was in religious nomenclature and in speech.

The foregoing review can furnish only a glimpse of the many interesting questions raised, and the various methods of approach used by the author in this valuable paper.

His conclusions are, in general, those held by the reviewer, but the mpression cannot be escaped that Dr. Kroeber has reached approximately correct results despite the fact that a considerable part of his material was very scanty and of doubtful accuracy. Given a good comparative dictionary and grammar of the various Philippine languages, and complete studies of the religious ideas and customs of the tribes under discussion, it is conceivable that the method employed in this paper might prove of great value as one method of approach to our problem. Unfortunately, such comparative studies do not exist at the present time. The *Diccionario mitológico* of Blumentritt is an assemblage of data from all sorts of sources, made by a compiler unfamiliar with the Philippines. As a result, his list of religious terms contains many words descriptive of some religious act or personage; while others without religious meaning may have been applied to some particular case in question. As examples of this, the following words, of quite general use throughout the archipelago, are selected from the list.

Blumentritt Definition	General Use
balon or *baon*. . boat offering to the dead	Provision for a journey.
bayok. . . . . transvestite priest	A single woman beyond marriageable age.
kabal. . . . . a charm or herb of invulnerability	Coat of mail, armor.
laki). . . . . war god (Pangasinan)	Head man. Grandfather. Also
apo-laki). . . . . mountain monster (Bikol)	used as term for God by Christianized Ilocano and Pangasinan.
Iimokon. . . . . omen bird	Turtle dove.
tali or). . . . . a divination	Rope or cord. The prefix *pag-*
pag-tali).	customarily denotes instrument. Divination by means of swinging objects suspended by cords is widespread in the Islands.

In this list of forty-three "religious" terms only two are credited to the Ilocano. Imperfect as is the reviewer's knowledge of this dialect he finds that it contains ten words of the list, and if we distribute these as Dr. Kroeber has done it appears that the Ilocano hold six in common with Mindanao, two with the Igorot, two with Pangasinan, six with Tagalog, two with Bikol, and six with Bisaya. Thus it would follow that this tribe residing at the northern end of Luzon is as closely related, in religious nomenclature, to Mindanao as it is to Visaya and Tagalog, and much closer than to the neighboring Igorot. A similar list might be just as readily compiled for the Bagobo or Mandaya, but these instances will serve to show the unreliability and incompleteness of the Blumentritt data.

Attention should also be called to the fact that, oftentimes, religious rites or personages are taken over without their original names, and they then appear under different titles which are generally descriptive. In such cases they can be recognized only by one familiar with the subjects and languages in question.

Again, religious names and terms may often be carried, by trade and other agencies, without their ordinary significance, and they then appear in their new setting without being in any way a reflection o borrowed religious ideas. Probably the best example of this is in the widespread use of our term for deity, used as an oath.

Throughout this study, the author has used the term "Igorot" to designate "the pagan mountaineers of northern Luzon other than Negritos." He, therefore, classes the Apayao, Tinguian, and Kalinga with the Bontok and southern Igorot, Ifugao and probab'y Ilongot. This, in the opinion of the reviewer, is no more justified than it is to class all the pagan tribes of Mindanao in one group, or to treat the Christianized tribes as a unit. In a previous paper[1] attention has been called to the fact that, despite many differences, the first three groups mentioned fall into one class which can be opposed to the Igorot on grounds of physical type, language, religious customs, house building, and particularly of social organization. Attention was likewise called to the great similarity between Tinguian and Ilocano, and the opinion offered that they are but divisions of one people.[2] Further studies, soon to be published, tend still further to confirm this belief. A full discussion is not possible here, but it may be briefly stated that rice culture, spinning,

[1] F. C. Cole, Distribution of the non-Christian Tribes of Northwestern Luzon, *American Anthropologist*, N. S., vol. XI, 1911, p. 329.

[2] F. C. Cole, The Tinggian, *Phil. Jour. of Science*, vol. III, Sec. A, 1908, p. 197.

weaving, and other industries which on the surface appear very similar in the Tinguian—Ilocano, and Igorot groups, really show them to differ quite as markedly in material culture as they do in house building, social organization, religion and folklore. It should also be noted that some of of the cultural considerations which caused Dr. Kroeber to separate the Igorot from the other Filipinos do not apply to the Tinguian. The people of this group do blacken the teeth, they do have the blow-gun, they do not have a kin group plan of society, and they make very little use of tattooing.

These and other considerations have led me to the conclusion that in northern Luzon we have evidence of at least two waves and periods of migration, the members of which are of similar physical type and language. It also appears that prior to their entry into this region they had developed or received social organizations and other elements of culture, very different from one another, and that they brought these with them and continued them in their present habitat.

If the term "Igorot" is confined to the people of Bontok, Lepanto-Bontok, and the Ifugao region, the uniqueness of this group may possibly be maintained, but if the Apayao, western Kalinga and Tinguian are added to this classification, the fundamental unity disappears and we are no longer justified in setting the Igorot, as a group, apart from the other Filipino.

Whatever may be our disagreement with certain portions of the paper, and our criticism of the material used, all workers in Malaysia will welcome Dr. Kroeber's new paper. It applies a method of handling data hitherto untried in Philippine research; it raises for discussion a number of new problems, and it also indicates a growing interest in the Islands on the part of our American scholars.

FAY-COOPER COLE

AFRICA

Harvard African Studies II; Varia Africana II. ORIC BATES, *ed.* Cambridge, Mass., 1918. 12 + 324 pp., numerous pls. and text figs.

Together with its predecessor this volume forms a worthy monument to the zeal and generosity of its editor, whose death truly signifies an irreparable loss for the pursuit of African studies in this country. Except for linguistics, all phases of anthropology are represented, with ethnography clearly preponderating as to space and number of articles. Naturally it is possible to call attention to only a few of the more important papers.

The volume opens with Dr. G. A. Reisner's "Preliminary Report on the Harvard-Boston Excavations at Nûri: the Kings of Ethiopia after Tirhaqa" (pp. 1–64), a lavishly illustrated contribution which will doubtless commend itself to Egyptologists. It summarizes results secured during an expedition jointly financed by Harvard University and the Boston Museum of Fine Arts in 1916–1917. In "Certain Rites of Transition and the Conception of Nau among the Hottentots" (pp. 65–82) Mrs. A. W. Hoernle adds welcome details as to the usages and taboo notions of a people far too little known and rapidly approaching extinction or acculturation. The notes on menstrual customs are particularly interesting. In reproducing "Some Early Drawings of Hottentot Women" (pp. 83–99) Dr. E. A. Hooton adds certain general comments, especially on true steatopygia, which he holds "has been satisfactorily demonstrated in modern races only among the Bushmen and Hottentots." As to the Hottentot apron he categorically states that its "development is natural and not artificial." This remark seems to call for fuller substantiation in view of the widely prevalent belief that at least in part artificial deformation is involved in the phenomenon. Junod, to be sure, is not a physical anthropologist, but his information as to corresponding southern Bantu customs is so specific (*The Life of a South African Tribe*, I, pp. 183, 489) that it can hardly be ignored in a discussion of the subject.

An important monograph on a powerful group of Anglo-Egyptian camel nomads is presented in Dr. C. G. and Mrs. B. Z. Seligmann's "The Kabâbîsh, a Sudan Arab Tribe" (pp. 105–185). Predominantly of Arab stock, these people exhibit appreciable strains of Hamitic and even Negro blood. Their closest kin from a physical point of view are the Arabs of Northern Arabia and of Egypt. The authors' data on sociology are especially full and intrinsically significant. We find the mother-in-law taboo and other rules of avoidance, which as usual are viewed by the natives as signs of respect (pp. 126–128); teknonymy (p. 123 seq.); and marriage with the daughter of the paternal uncle as the orthodox form, that with the maternal uncle's daughter being a makeshift (p. 138). The high status of women in a tribe following Islam is worthy of note. Comparative remarks greatly enhance the value of what would be, even without them, a valuable descriptive account.

Dr. W. S. Ferguson's essay on "The Zulus and the Spartans: a Comparison of their Military Systems" (pp. 197–234) does not attempt any wild historical conjectures, as the title might suggest, though a detailed comparison of the Zulu and the Masai might be of greater in-

terest to the ethnographer. Dr. Ferguson succeeds in furnishing a very live picture of the Zulu system, for which all who have wrestled with the more than scattered Zulu literature will be profoundly grateful. A curious blunder occurs in this paper, inasmuch as the Masai are referred to as Bantu. This is certainly not the alternative to Merker's untenable hypothesis of a Semitic origin. According to Meinhof, Masai is a Hamitic tongue, a conclusion accepted by a discriminating critic as possible, though not demonstrated (Sapir, in *Current Anthropological Literature*, vol. II, 1913, pp. 25–27). At all events, Bantu affiliations, aside from some infiltration of Bantu blood, are definitely out of the question. "In East Africa," writes Sir Charles Eliot, "the Masai are clearly distinguished by their language, customs, and appearance from the Bantu races" (A. C. Hollis, *The Masai*, p. xi).

As an earnest of Continental coöperation there is an article by Professor A. Van Gennep (pp. 235–298), "Recherches sur les poteries peints de l'Afrique du Nord française (Tunisie, Algérie, Maroc)." This paper consists of technological details regarding the pottery manufactured in a great number of North African centers, one locality being passed in review after another. In his conclusion the author calls attention to the intimate connection of the ceramic style of ornamentation with Berber decoration of woodwork, metal work, basketry, and weaving. He joins M. de Zeltner in recognizing that the ancient culture of Mediterranean Europe extended its sphere of influence far into Africa, profoundly affecting the industrial life and customs of the population as far south as the Senegal and Niger.

Every well-wisher of anthropology will hope that the splendid enterprise called into being by the lamented editor will find ample support ensuring continued publication.

ROBERT H. LOWIE

SOME NEW PUBLICATIONS

Barrett, S. A. Myths of the Southern Sierra Miwok (University of California Publications in American Archaeology and Ethnology, vol. 16, no. 1, pp. 1–28). Berkeley, 1919.

——. The Wintun Hesi Ceremony (University of California Publications in American Archaeology and Ethnology, vol. 14, no. 4, pp. 437–488, pls.22–23, 3 figs.). Berkeley, March, 1919.

Colton, Harold Sellers. Geography of Ruins near the San Francisco Mountains (Bulletin of Geographical Society of Philadelphia, vol. XVI, no. 2, pp. 37–60). April, 1918.

Czaplicka, M. A. The Turks of Central Asia in History and at the Present Day. Oxford University Press, Oxford, 1918. 242 pp., map.

Dearborn, George Van Ness. The Psychology of Clothing (Psychological Monographs, vol. XXVI, no. 1, whole no. 112, pp. vi + 72.) Princeton, 1918.

Goddard, Pliny Earle. Myths and Tales from the White Mountain Apache (Anthropological Papers of the American Museum of Natural History, vol. XXIV, pt. II, pp. 87–139.) New York, 1919.

Heye, George G. Certain Mounds in Haywood County, North Carolina (Contributions from the Museum of the American Indian, Heye Foundation, vol. V, no. 3). New York, 1919. Pp. 35–43, 4 pls., 1 fig.

Heye, George G., Hodge, F. W., and Pepper G. H. The Nacoochee Mound in Georgia (Contributions from the Museum of the American Indian, Heye Foundation, vol. IV, no. 3). New York, 1918. 103 pp., 57 pls., 63 figs.

Kroeber, A. L. Kinship in the Philippines (Anthropological Papers of the American Museum of Natural History, vol. XIX, pt. III, pp. 69–84). New York, 1919.

Laufer, Berthold. La Mandragore (Extrait du T'oung-pao, 2 Serie, vol. XVIII, no. 1 et 2, Mars-Mai, 1917). Leiden, 1918. 30 pp.

Loud, Lewellyn L. Ethnogeography and Archaeology of the Wiyot Territory (University of California Publications in American Archaeology and Ethnology, vol. 14, no. 3, pp. 221–436, pls. 1–21, 15 figs.). Berkeley, 1918.

Lowie, Robert H. The Matrilineal Complex (University of California Publications in American Archaeology and Ethnology, vol. 16, no. 2, pp. 29–45). Berkeley, 1919.

——. Myths and Traditions of the Crow Indians (Anthropological Papers of the American Museum of Natural History, vol. XXV, part 1, pp. 1–308). New York, 1918.

Means, Philip Ainsworth. Distribution and Use of Slings in Pre-Columbian America, with Descriptive Catalogue of Ancient Peruvian Slings in the United States National Museum (Proceedings, U. S. National Museum, vol. 55 pp. 317–349, pls. 22–27). Washington, 1919.

Parkins, A. E. The Indians of the Great Lakes Region and their Environment (Geographical Review, vol. VI, pp. 504–512). New York, Dec., 1918.

Sapir, E. An Ethnological Note on the "Whiskey Jack" (The Ottawa Naturalist, 1918, vol. XXXII, no. 6, p. 116 seq).

Saville, Marshall H. A Letter of Pedro de Alvarado relating to his Expedition to Ecuador (Contributions from the Museum of the American Indian, Heye Foundation, vol. V, no. 1). New York, 1917. 6 pp., 1 pl.

Spier, Leslie. The Trenton Argillite Culture (Anthropological Papers of the American Museum of Natural History, vol. XXII, pt. IV). New York, 1918. pp. 167–226, 11 figs.

Wissler, Clark. Archaeology of the Polar Eskimo (Anthropological Papers of the American Museum of Natural History, vol. XXII, pt. III, pp. 105–166, figs. 1–33, 1 map). New York, 1918.

DISCUSSION AND CORRESPONDENCE

Identity of the Westo Indians

In a recent number of the *Anthropologist*[1] Professor Verner W. Crane has placed on record some valuable discoveries relative to the Westo Indians who figure so prominently in early Carolina history, in particular his identification of this tribe with the Rickohockans who invaded Virginia in 1656, an identification which I cordially endorse. With his argument that the Westo were distinct from the Yuchi I do not, however, concur and for the following reasons.

Nowhere in the historical documents do the Yuchi appear under their own appellation, Tsoyaha, but under names either certainly or probably derived from other Indian tongues. Two of these besides the word Yuchi,—Tohogale, an Algonkian term, and Hogologee, of unknown origin but probably Muskhogean,—Professor Crane mentions himself. Therefore the employment of another distinct term, Westo, need not trouble us. It was probably applied by the coast Indians of southern South Carolina and is to be compared with the tribal names Stono and Edisto, from the same region. More important yet is the fact that two, and perhaps three, branches of the Yuchi were known to early historians and cartographers under distinct names. The Tennessee river Yuchi were almost always called by their Algonkian term Tohogale or Tohogaria; the Yuchi north of the present Augusta, Ga., about Uchee island, Hogologees, or Hog Logees; and those on Ogechee river by the name of that stream. The second of these is particularly noteworthy because, after the removal of this band of Yuchi to the Chattahoochee river it appears under its distinct name in spite of the fact that higher up is a Yuchi town so labelled. Therefore the fact that the Westo town is also distinct does not prove that the Westo and Yuchi were distinct peoples.

But there was still another appellation for the Yuchi, that given to them by the early Spanish writers, and first by the chroniclers of De Soto's expedition, the name Chisca. Proof of this rests on circumstantial evidence only, but that of the strongest. We have it first as of a people in the eastern mountains of Tennessee encountered by De Soto, Pardo, and Moyano, and we know that there was a Yuchi band there, occupying in later times a town called Tsistuyi, "Frog town," by the

[1] Vol. xx, pp. 331–337.

Cherokee, possibly a pun on Chisca, a town which the Cherokee destroyed about 1714.[1] The name occurs again as that of a "wandering people" who in 1639 were induced to locate on what is now Choctawhatchee river by one of the Florida governors,[2] and here a Yuchi tribe is known to have lived at a somewhat later period. They ultimately settled on Tallapoosa river not far from old Tukabachee town. Finally, in the Creek migration legend as recorded by Hawkins, Savannah river is called Chiska Talofa Hatchee, "Chisca town river." There is more evidence to the same effect which can not be set forth in full at this time, but if the identification is correct the following excerpt from a letter written by La Salle from the Illinois country about 1682 is of great significance. Speaking of the Tennessee river and the tribes living along it he says: "The Apalatchites, people of English Florida, are not far from some one of its most eastern branches, because they have war with the Tchataké (Cherokee) and the Cisca, one of whose villages they burned, aided by the English. The Ciscas then abandoned their former villages, which were much further east than those from which they have come here."[3] He mentions the Chisca in a later communication as one of the tribes which he had assembled about Ft. St. Louis (near the present Utica, Ill.).[4] As no war of consequence was waged by the Carolina settlers just before this date other than that on the Westo, and as there is independent evidence that the Cisca or Chisca were Yuchi, does not this reference add great strength to the argument for a Yuchean affiliation of the people called Westo?

The following letter from Governor D. Alonso de Aranguiz y Cotes, dated Sept. 8, 1662, is important because it seems to contain a record of the invasion of Spanish territory by the Rickohockans or Westo after they had been driven from Virginia, six years before. He says:

> In a letter of Nov. 8, of the past year, 1661, I recounted to Y. M. how in the province of Goale, near this presidio, there had entered some Indians who were said to be Chicumecos which ate human flesh, and if I had not assisted in opposing their design they would have destroyed it, as I had news regarding others from Infidel Indians who came fleeing from them, and as I saw that they would retire by the way they came I made examinations and inquiries in different directions until I took four prisoners near the province of Apalachecole which is a hundred and eighty leagues distant from this presidio. Having sent infantry for

[1] Colonial Documents of South Carolina, MS.

[2] Serrano y Sanz, Documentary History, p. 199.

[3] Pierre Margry, Découvertes et Établissements des Français dans l'Ouest et dans le Sud de l'Amérique Septentrionale (1614–1754), vol. II, p. 197 (1877).

[4] *Ibid.*, p. 318.

the purpose I took some Indians of the Chisca nation to serve as interpreters of their language because there was no one in these provinces who could understand them, and they said they were from Jacan, that when they retired from the province of Goale they went to that of Tama and to that of Catufa, and that there they wandered about in different bands, and the said Chisca Indians, after having explained what people they were said that very near the lands of those people there was only one very large river, on the middle course of which had fortified themselves a nation of white people who warred with them continually and were approaching these provinces and they do not know whether they are Spaniards or English.[1]

It is to be noticed that though they are referred to as distinct from the Chisca, the Chisca are called in as interpreters, and Yuchi is certainly no nearer Mohawk than any of the other southeastern languages. My own solution is that the people called Chisca, who were appealed to as interpreters, represented an earlier wave of Yuchi immigration and the wandering people who appeared in 1661 a later immigration of tribes linguistically related, the bands known otherwise as Rickohockans and Westo.

If the Chisca were Yuchi, Spanish documents prove that they had penetrated as far as Florida long before 1670, and this answers Professor Crane's first objection to the position taken by Dr. Speck and myself. To his second objection, that there is documentary evidence that none of the Westo remained in South Carolina after 1681 I would reply that I do not contend that the term Westo was applied to all Yuchi any more than the term Hogologee was always applied to all of them. It is perfectly evident that such was not the case. I will go farther and concede that the settlement of the people later called Yuchi and Hogologee *may have been* subsequent to the expulsion of the Westo in 1681. My contention is that the Westo were a Yuchi tribe, not that the name was necessarily applied to all Yuchi. The historical documents indicate to me very strongly, if they do not absolutely prove, that the Chisca mentioned by the Spaniards were Yuchi, and that the Cisca of La Salle were the Chisca of the Spaniards and the Westo of the English. The statement cited by Professor Crane that the Mohawks were "strictly aleyed to the Westos" I think should be taken in a political, not in an ethnic or linguistic sense.

While I believe the facts favor the conclusion arrived at by Dr. Speck and myself and consider it more satisfying to identify a tribe with something known than to leave it as a mystery I have no deeply seated

[1] Lowery MSS.

prejudice against an Iroquoian identification of the Westo if facts are produced to establish it. Although I have found that a careful sifting of material leaves very few mysteries in the classification of tribes, some such mysteries do remain. One of these in particular I will mention in hopes that Professor Crane or some other investigator may be able to furnish the solution. This is the identity of a tribe called Tamahita, which figures most prominently in a letter written by Abraham Wood to John Richards, Aug. 22, 1674, detailing the travels of James Needham and the—real or supposed—travels of Gabriell Arthur. The tribe was then in a stockaded town on the upper Tennessee. Some years later they turn up among the Lower Creeks, and a part of them at least lived for a time among the Upper Creeks. The memory of such a tribe, confounded however with the Timucua of Florida, was preserved among some of the Creek Indians up to a few years ago. They may have been Yuchi, Cherokee, or possibly, if the Westo were not Yuchi, identical with that tribe. A key to the solution of the problem presented by them has yet to be found.

JOHN R. SWANTON

BUREAU OF AMERICAN ETHNOLOGY,
WASHINGTON, D. C.

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PROFESSOR G. E. HALE,
President National Research Council,
Washington, D. C.

NEW YORK CITY,
March 6, 1919.

My dear Professor Hale: At the meeting of the American Anthropological Association held in Baltimore, December 27, Professor J. C. Merriam, representing the National Research Council, made a formal statement of the plans of the Council in regard to the organization of science, and requested an expression of opinion on the part of the American Anthropological Association in regard to the position of anthropology in the work of the National Research Council.

In consequence of this request and the discussion following it, the undersigned were appointed a committee for the purpose of giving to the National Research Council information in regard to the work actually done by American anthropologists. A statement has been added pointing out the causes for the slow development of certain branches of anthropology.

The committee submitted a number of questions to American anthropologists and attached to this are a number of replies to our circular letter.

The general tendency of the scientific work of American anthropologists may briefly be summarized as follows: It is but natural that in a

country like our own, which contains the remains of a considerable number of primitive people, the historical interest in the aborigines, combined with the ease of accessibility of the remnants of the ancient tribes, should bring it about that inquiries relating to their customs, languages, and physical types should dominate American anthropological research, and that theoretical work should be based very largely upon the results obtained from a study of American tribes. The methods which give the easiest results in regard to these problems are archaeological, ethnographical, and linguistic and for this reason these three lines of inquiry have hitherto predominated in the research work of American anthropologists.

At the same time the necessity for a broader outlook is keenly felt. The Field Museum of Natural History has included in the scope of its work eastern Asia, Malaysia, and Melanesia. Harvard University has expanded its work over Africa. The University of Pennsylvania has undertaken research work in South America, the American Museum of Natural History and the United States National Museum, in Asia, and a few other attempts of similar kind for obtaining a wider basis for research in cultural history may be noted.

The field of work of American anthropologists is also in part determined by the character of the institutions that maintain anthropological work. The Bureau of American Ethnology which forms part of the Smithsonian Institution is by law restricted to work on the natives of America and the Hawaiian islands. Most positions held by working anthropologists are museum positions, and consequently the scientific work is largely restricted to those aspects of anthropology that yield tangible specimens. University positions are on the whole of such a character that the funds necessary for the conduct of field work are not supplied by the universities, but if available at all, come from museums.

Anthropologists have felt for a long time that their work needs expansion, and many attempts have been made to free anthropological research from the restrictions dependent upon the association of anthropological work with museums on the one hand, and from those conditions that tend to give undue preponderance to work on American Indians on the other hand. Attempts have been made particularly to direct attention to African problems, which are of importance to us on account of our large negro population, and also to investigations on racial anthropology among the white and negro populations of the United States. Work of this kind needs financial support, but all attempts have failed to interest the government institutions which command considerable funds, or private individuals, to support work of this kind. There is a

peculiar hesitancy in regard to undertakings of this type, which will not be overcome until more work on a smaller scale has been done. Investigations of this description have been undertaken by American anthropologists and by educators, sociologists, and medical men with anthropological leanings. Recently, biologists have also directed their attention to this subject, but methods applied and results obtained up to this time are quite unsatisfactory. Work on human paleontology is also not vigorously pursued.

The difficulty of giving anthropological research an adequate position in the scheme of the National Research Council is largely based on the fact that the humanities find no place in the general scheme of work of the Research Council. While anthropology must necessarily be based on the one hand on biological science, on the other hand it is intimately associated with the humanities. It is impossible to treat even the biological problems of anthropology without a due regard to the cultural aspect of anthropology, because the forces which determine the development of human types are to a very large extent cultural forces.

The peculiar position of anthropology brings about close contact with a great many different sciences,—biology, geology, paleontology, geography, psychology, history, linguistics, and the whole range of humanities. Coöperation will be necessary according to the particular type of problems taken up, and anthropology will be best served by an entirely free association with different subjects, according to the need of each case.

It is the opinion of the undersigned committee that the appointment of a director of anthropological work, who would have a dominant influence over organized work, would not be helpful on account of the great diversity of subject matter included in anthropology, and might prove decidedly prejudicial on account of the necessity of developing this subject in different directions. Much better results would undoubtedly be obtained by regular meetings of representative scientists, and by the appointment of a secretary who would carry out the necessary clerical work.

Yours very respectfully,

(Signed) FRANZ BOAS, *Chairman*,
ALEŠ HRDLIČKA,
ALFRED M. TOZZER

ANTHROPOLOGICAL NOTES

PROFESSOR ROLAND B. DIXON, Dr. Charles Peabody, and Dr. William Curtis Farabee, Anthropologists in attendance at the Peace Congress in Paris, were honored by election to French societies, as follows: "Membre Correspondant de l'Association pour l'enseignement des sciences anthropologiques" and also "Membre Associé étranger de la Société d'Anthropologie de Paris."

DR. WILLIAM CURTIS FARABEE has been elected a member of the American Philosophical Society of Philadelphia.

THE Anthropological Society of Philadelphia with the May meeting closed a very successful season. The Society has steadily grown to a present active membership of twenty-six and a mailing list of twenty-two. Dr. W. W. Hyde, Professor of Ancient History and Greek, University of Pennsylvania, is President; Dr. F. G. Speck of the Department of Anthropology is Chairman of the Executive Committee; E. P. Wilkins is Secretary-Treasurer; and R. T. Aitken is Assistant.

Subjects of Papers 1918–19:

"Man as a Species of Mammalian Fauna," Dr. Spencer Trotter.
"Mendelism as an Explanatory of Mimicry," Dr. Phineas W. Whiting.
"Primitive Property Rights," Dr. Robert H. Lowie.
"Some Biblical Texts Illustrating Ancient Trade Routes," Dr. Wilfred H. Schoff.
"The Change of Mind about the Earth," Hon. Gifford Pinchot.
"The Origin of Symbols," Wm. L. Tolan.

MR. A. M. HOCART has been appointed to an archaeological commissionership in Ceylon. Before entering upon his duties he will spend a year at Exeter College, Oxford.

DR. JOHN SWANTON, during the spring, was engaged in fieldwork among the Indians of Oklahoma. He has practically completed his investigations on the social organization of the Choctaw and Chickasaw Indians. He visited Anadarko to ascertain the present condition of the Caddoan tribes in that neighborhood and discovered that the language of the Kichai Indians is verging on extinction. The necessity for taking prompt action to preserve a record of this language is imperative.

In order to increase local interest in the science of anthropology, Dr. J. Walter Fewkes, on his recent trip to Austin, Texas, gave four lectures to classes in the University of Texas. Three of these lectures described "The Hopi Snake Dance" and the fourth "The Aborigines of Porto Rico, West Indies." He also gave two illustrated lectures to the general public, entitled, "The Indian as a Stone Mason" and "The Mesa Verde National Park."

Dr. Walter Hough of the United States National Museum spent the latter part of May and the month of June in a continuation of his ethnological and archaeological work in the White Mountain reservation and westward into Arizona.

Mr. Francis LaFlesche returned in May from the field in Oklahoma where he has been carrying on his investigations among the Osage Indians.

Mr. J. N. B. Hewitt was engaged in fieldwork among the Iroquois during the months of May and June.

Mr. J. P. Harrington returned early in June from the field after an absence of eleven months in which he accumulated a large amount of linguistic material in Oklahoma, New Mexico, and California.

Mrs. J. P. Harrington, who is a trained ethnologist, stenographer, and typist, accompanied her husband and was of great help in his work. She remained at Taos, New Mexico, to check up some of the results.

On June 3, Dr. Aleš Hrdlička, Curator of the Division of Physical Anthropology, visited New York for the purpose of attending a meeting of citizens interested in the problems of immigration. The main topic discussed was "What can be done by men of science and students of social questions to effectively assist the existing agencies, including the Congress, that deal with immigration?" These agencies are now called upon to solve or adjust the knotty problems of immigration and emigration; tasks which are steadily growing in number and importance. A committee was named which is to outline, so far as possible, the whole scope of the question and to suggest means for its consideration and effective treatment.

Professor J. E. Pearce, of the University of Texas, has been doing important archaeological work for the Bureau of American Ethnology on a village site at Dry Creek, four miles from Austin, Texas. A number of characteristic artifacts have been obtained.

MR. GERARD FOWKE is making important archaeological excavations in Miller Cave, Pulaski county, Missouri, with an allotment from the Bureau of American Ethnology. The cave floor measures 85 by 65 feet and he has already penetrated the layer of ashes to the depth of 12 feet. The results of the work thus far accomplished (and a beginning only has been made) promise valuable results as the ashes are removed.

PROFESSOR A. L. KROEBER has been appointed full Professor in the Department of Anthropology at the University of California. Professor Kroeber has been the head of that department since the retirement of Professor Putnam in 1902, and almost solely responsible for the development of the instruction in anthropology in that institution and for the series of publications as well as the research work which lies behind them.

DR. PAUL RADIN has been appointed Assistant Professor in the same department.

MR. LESLIE SPIER has been granted a leave of absence from the American Museum of Natural History until June 30, 1920. He has been appointed Cutting Traveling Fellow by Columbia University. Mr. Spier will devote the year provided by the fellowship to a continuation of his work among the Yuman peoples of Arizona.

DR. CLARK WISSLER visited, during June and July, the ruin Aztec near a town of that name in New Mexico. He inspected the work which has been done there by the American Museum of Natural History and arranged for its continuance.

MR. ROBERT T. AITKEN has been appointed to a position in the Milwaukee Museum made vacant by the resignation of Dr. E. W. Hawkes.

MISS HELEN C. GUNSAULUS has been appointed Assistant Curator of Japanese Ethnology in the Department of Anthropology in the Field Museum of Natural History, Chicago.